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DEPARTMENT OF PUBLIC WORKS

DIVISION OF WATER

ANNUAL REPORT

1944

A N N U A L R E P O R T

O F T H E

D I V I S I O N O F W A T E R

Hon. Joseph M. Byrne, Jr., Director
Department of Public Works
Newark, New Jersey

Dear Sir:

Submitted herewith is the annual report covering all activities of the Division of Water for the year ending December 31, 1944.

Water consumption for the year exceeded all previous records, amounting to 27,864 million gallons or a daily average of 76.3 million gallons, which amount does not include water purchased from the North Jersey District Water Supply Commission. The transmission and distribution systems were able to carry the extra load without appreciable reduction in pressure, excepting in a few sections of the city during the excessive warm periods when hydrants were illegally used by persons operating pools.

The total earnings for the year amounted to $3,207,306.17; total expenditures amounted to $2,611,173.92 of which $1,354,474.17 was expended for fixed charges, interest, sinking fund and serial bond payments, resulting in a surplus of $596,132.25.

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The total active personnel amounted to 402 employees at the beginning of the year and 389 employees at the end of the year, a reduction of 13 employees. Reduction in the forces during the year through deaths, resignations, retirements and transfers amounted to 22 employees but the addition of 9 employees resulted in the net reduction of 13. In addition to the above 18 employees are in the armed service of the United States, 29 employees are on leaves of absence engaged in war work and 10 employees are carried on the payroll on pension and compensation awards.

Employees in the armed services of the United States of America are:

Alfred E. Anderson	Assistant Engineer	John M. Rees	Asst. Reservoir Attd't.
Eugene E. Dunn	Telephone Operator	John B. McNally	Transitman
Edward Del Toma	Inspector	Frank McTague	Repairman
Peter J. Devito	Foreman	Charles Mount	Asst. Superintendent
Samuel Etheridge	Laborer	Glynden Norman	Laborer
Julius Fogarella	Inspector	Emanuel Rosen	Telephone Operator
Herbert E. Hindstone	Clerk	Douglass Robb	Laborer
Patrick Goldrick	Laborer	William L. Wilkinson	Inspector
Lawrence Hatcher	Repairman	Frank Yacavone	Laborer

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Submitted herewith is the annual report covering all activities of the Division of Water for the year ending December 31,1944.

Water consumption for the year exceeded all previous records, amounting to 27,564 million gallons or a daily average of 75.3 million gallons,which amount does not include water sold to Bayonne by the North Jersey District Water Supply Commission. The transmission and distribution systems were able to carry the extra load without appreciable reduction in pressure, excepting in a few sections of the city during the excessive warm periods when hydrants were illegally used by boys for bathing purposes.

The total earnings for the year amounted to $3,207,306.17; total expenditures amounted to $2,611,173.92 of which $1,354,474.17 was expended for fixed charges, interest, sinking fund and serial bond payments, resulting in a revenue surplus of $596,132.25.

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E.Albert Del Poma	Inspector	Frank McTague	Repairman
Hubert Devita	Foreman	Charles Mount	Asst.Superintendent
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Julius Forcella	Inspector	Emanuel Rosen	Telephone Operator
Herbert M.Gladstone	Clerk	Douglass Robb	Laborer
Patrick Goldrick	Laborer	William L.Wilkinson	Inspector
Lawrence Hancher	Repairman	Frank Yacavone	Laborer

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By your direction the Water Division has operated as a separate unit of the Department of Public Works, the Division Engineer reporting directly to you. This procedure was established officially by the Board of Commissioners by ordinance passed on final reading on November 1,1944.

Respectfully,

WILLIAM G.BANKS
DIVISION ENGINEER.

WGB:FF

DIVISION OF WATER

ANNUAL REPORT

1944

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COLLECTION

PEQUANNOCK SUPPLY

The precipitation on the Pequannock Watershed as determined from the average of observations at three locations, Canistear, Oak Ridge and Charlotteburg amounted to 48.30 inches for the year 1944. This is only slightly below the average, which for the years of record since 1893 is 48.93 inches.

The month of greatest rainfall was November with 6.89 inches and the month of least rainfall was May with 1.87 inches, the greatest rainfall occurring during March, April, September and November. There was no snow on the ground at the beginning but at the end of the year there was considerable.

STORAGE AND DEPLETION - PEQUANNOCK SUPPLY

At the beginning of the year, all Pequannock Reservoirs were drawn down, the quantity of water in storage being 8,700 million gallons. Reservoirs remained depleted until the end of February, when they began to fill, reaching capacity on March 30th and remaining full until May 15th, when depletion again started. The decrease in storage continued with the exception of a slight increase, due to the hurricane in September, until November 15th, at which time there were only 4,900 million gallons left in storage, which amount was 7,200 million gallons below capacity. This was the greatest depletion in the Pequannock Reservoirs since 1930 when the Wanaque supply was placed in service. The latter part of November, the reservoirs began to fill and storage continued to increase until the end of the year, at which time the total storage amounted to 8,000 million gallons, about 4,000 million gallons below capacity.

WATER DIVERSION - PEQUANNOCK AND WANAQUE SUPPLIES

A total of 19,052.9 million gallons of water were diverted from the Pequannock Watershed during 1944 as contrasted with 16,593.7 million gallons in 1943, an increase of 2459.2 million gallons.

From Wanaque Reservoir 8,498.5 million gallons of water were taken by Newark in 1944 as compared with 10,042.5 million gallons in 1943, a decrease of 1,544.0 million gallons.

Month by month figures of the amount of the 1944 diversions are shown in the last columns of Table II of this report.

The Pequannock diversion figures differ from the figures of consumption of Pequannock water by the amount of the gain or loss in storage in Cedar Grove Reservoir. The total consumption of Pequannock water as seen in the next paragraph is more than Pequannock diversion by 12.6 million gallons, which represents the net loss in Cedar Grove Reservoir storage during the year 1944.

WATER CONSUMPTION - PEQUANNOCK AND WANAQUE SUPPLIES

The total consumption of water in the Newark system for the year 1944 was 27,564.0 million gallons (an average of 75.5 million gallons daily), an increase of 961.4 million gallons (2.6 million gallons daily) over the 1943 figure of 26,602.6 million gallons, total for the year, (72.9 million gallons daily).

Of the total consumption 19,065.5 million gallons (52.1 million gallons daily) were from the Pequannock Supply and 8,498.5 million gallons (23.2 million gallons daily) from the Wanaque Supply as compared with 16,560.1 million gallons (45.4 million gallons daily) from Pequannock in 1943 and 10,042.5 million gallons (27.5 million gallons daily) from the Wanaque in 1943. While the increase in consumption was found to be largely in the Pequannock Supply, six (6) million gallons daily of Pequannock water were used in the Belleville-Wanaque level from the beginning of the year until March 8th, this amount was gradually increased to nine (9) million gallons on March 15th, and remained at this amount until May 15th. During the months of July and August, which was a period of high temperatures, the consumption was greatly increased due largely to the unauthorized use of fire hydrants for

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Of the total 1944 consumption of 27,564.0 million gallons 22,068.1 million gallons (60.3 million gallons daily) were consumed in Newark and 5,495.9 million gallons (15.0 million gallons daily) were delivered to other systems. For details see Tables Nos. I and II of this report.

The consumption of water in the Newark system reached a new high in 1944. During the months of July and August, which was a period of high temperatures, the consumption was greatly increased due largely to the unauthorized use of fire hydrants for bathing purposes during this hot spell.

On the basis of the average daily consumption figures for 1943, which were 78.6 million gallons daily in July, and 80.3 million gallons daily in August, the comparable 1944 figures increased to 80.3 million gallons daily in July, and, 84.1 million gallons daily in August; increases of 1.7 million gallons daily and 3.8 million gallons daily respectively.

For the period beginning June 27th and ending September 8th, the daily consumption ranged from 86 million gallons daily to 93.6 million gallons daily on August 15th, high for the year.

TABLE I.

CONSUMPTION STATEMENT YEAR ENDING DECEMBER 31,1944

1944	Total consumption per month, million gallons, Newark, Belleville, Bloomfield, Elizabeth, Wayne, Paterson, Hackensack, Elizabethtown Water Co., Essex County Hospital (Verona), Pequannock Township and Commonwealth Water Company.	Average daily consumption, million gallons, Newark and Suburbs.	Total consumption per month, million gallons, Suburbs.	Average daily consumption, million gallons, Suburbs.	Total consumption per month, million gallons, Newark.	Average daily consumption, million gallons, Newark.	Average temperature, Newark.	Rainfall - inches, Newark.
January	2215.1	71.5	441.2	14.2	1773.9	57.3	32.6	4.45
February	2066.9	71.3	408.9	14.1	1658.0	57.2	32.0	2.46
March	2184.6	70.5	438.3	14.1	1746.3	56.4	36.7	6.45
April	2088.4	69.6	439.1	14.6	1649.3	55.0	48.3	4.85
May	2288.3	73.8	438.5	14.1	1849.8	59.7	65.6	1.55
June	2323.6	77.5	466.5	15.6	1857.1	61.9	71.4	3.52
July	2488.2	80.3	487.8	15.8	2000.4	64.5	77.8	2.43
August	2605.6	84.1	546.1	17.6	2059.5	66.5	76.2	2.29
September	2388.4	79.6	450.9	15.0	1937.5	64.6	68.2	10.28
October	2391.8	77.1	476.5	15.3	1915.3	61.8	54.5	2.35
November	2248.2	74.9	490.0	16.3	1758.2	58.6	44.3	7.41
December	2274.9	73.4	412.1	13.3	1862.8	60.1	30.6	2.96
Totals	27564.0		5495.9		22068.1			51.00
Average		75.3		15.0		60.3		

Estimated Population of Newark by Board of Health, December 31,1944.....440,000

Estimated Population of Other Municipalities Served,December 31,1944....140,000

TABLE II

1944	Belleville	Bloomfield	Elizabeth	Elizabethtown Water Co.	Packanack	Verona	Wayne	Pequannock Township	Commonwealth Water Co.	Total	Received from Wanaque (At Belleville)	Quantities Consumed From Pequannock Watershed	Quantities Diverted From Pequannock Watershed.
	PEQUANNOCK WATERSHED								RESERVOIRS AND STREAMS				
Jan.	77.4	138.8	212.4	1.4	5.6	5.5	1.2	0.2		441.2	765.5	1449.6	1460.9
Feb.	70.5	131.5	196.6	1.4	5.3	1.6	1.1	0.2		408.9	713.2	1348.7	1346.1
Mar.	75.5	140.6	209.7	1.5	6.0	2.5	1.8	0.2		436.3	663.8	1518.8	1501.4
Apr.	75.3	142.6	202.8	1.5	6.1	2.0	2.0	0.2		439.1	591.1	1497.3	1470.8
May	74.7	144.2	207.5	1.4	6.4	2.0	2.0	0.2		438.6	668.7	1619.6	1649.9
June	77.2	158.5	214.4	1.4	6.3	2.0	2.0	0.2		466.5	694.9	1628.7	1589.0
July	75.2	159.3	216.8	1.2	9.6	5.7	3.1	0.3		477.3	770.2	1718.0	1757.3
Aug.	81.5	167.0	233.6	1.4	9.5	11.4	3.9	0.3		513.6	809.0	1796.6	1790.9
Sept.	74.6	142.4	203.8	1.3	6.8	2.8	2.3	0.3		450.2	733.7	1654.7	1650.2
Oct.	77.3	158.0	222.1	1.6	5.3	1.6	1.8	0.3		476.5	719.2	1672.6	1668.4
Nov.	73.4	153.2	222.6	1.6	4.8	2.6	1.6	0.3		490.0	672.9	1575.3	1587.3
Dec.	61.8	136.6	203.3	1.5	4.9	1.9	1.4	0.3		412.1	682.3	1585.6	1570.6
Total	894.6	1772.8	2549.3	17.2	76.7	48.2	26.3	3.2	110.5	5496.9	8498.5	19065.5	19052.9

PEQUANNOCK WATERSHED

SANITATION

The population on the watershed increased to 1550 as compared with 1430 in year 1943. This increase is accounted for by transients, working in nearby war plants and boarding locally.

Garbage and refuse were collected and incinerated by city forces, as usual, during the year. Two intensive sanitary surveys and several special inspections were made of all premises on the drainage area. All toilets and cesspools were cleaned and 26 new cesspools were installed.

INSPECTION - GUARDS

Four men with two cars and two men with four horses were used to patrol the property to prevent trespassing, hunting and fishing. All streams in the area were walked twice during the year. One hundred and five (105) miscellaneous dead animals were picked up and disposed of. Garbage and papers were picked up along the highways at frequent intervals, and all recreational areas were patrolled. Twenty-one (21) persons were arrested and fined for trespassing during the year.

To prevent sabotage to the dams and structures, a twenty-four (24) hour a day guard was maintained at all important points during the year. The United States Army authorities dispensed with their supervision of this activity on November 17,1944.

Through telephones installed at all key points, hourly calls to Headquarters were continued.

RESERVOIRS AND STREAMS

Grass and brush were cut along all the reservoir flow lines and streams and the dams and approaches were mowed frequently. Copper sulphate was applied to the main river at Oak Ridge, Newfoundland and Charlotteburg and to Kanouse Brook and Echo Lake Brook. All flow lines and streams were walked after the hunting season and ice was cut away from reservoir dams during the winter. The upstream face of Canistear overflow dam was repaired, the work being done by Division forces. (See details of this work elsewhere in this report).

FORESTRY

Due to the shortage of manpower, 1944 was a quiet year insofar as forestry activities were concerned. Little or nothing was done in the way of silvicultural or fire supression work. Such labor as was available was used to maintain projects already inaugurated and in addition the following work was accomplished:

PLANTING

Two (2) fields of spruce, sold at public bid in 1943 were replanted and about 15,000 additional trees were "spot planted" in the Williamsville section.

Name of Property (N) Newark - (P) Private	Acreage	Number Corners Located	Number Concrete Monuments Set
Ida Stoeckel (N)	40.0		1
Martin Shippee (N)	10.0	4	4
J.Tintle (N)	98.1	1	1
Jos.Schulster Est. (P)		16	15
Mary Struble. 2nd (N)	1.3	1	1
J.V.Struble. 2nd. (N)	12.98	2	2
Carrie Vreeland. (N)	454.95	6	4
Thos.B.Vreeland (N)		2	2
Rutherford Est. (NP)	1526.50	15	8
J.& L.Davenport (P)	23.67	4	4
J.& Israel Card. (P)	46.10	5	1
Abram Farber. (N)	120.60	7	5
J.D.Rutherford (P)	72.50	5	
Totals		68	48

SALES

It is not an objective of the Department to derive income from the forest, except, (1) as such income may be obtained from products that might otherwise depreciate in value unless sold; (2) to obtain some forest or water benefit through selling or (3) where such sale may be made without any noticeable depreciation or loss to forest, water or aesthetics.

On this basis, a summary of the income from forest products sold during the year 1944 is as follows:

Boughs and Laurel Tips	$ 225.10
Spruce Trees (on stump)	69.00
Logs and Cordwood Stumpage	3,224.95
Cut Cordwood	11.00
Sales of wood to Board of Health	72.00
Total	$3,602.05

The log and cordwood stumpage sales were made from areas of fire damage or from mature or over mature timber, the cordwood being obtained from the tops of trees or from trees in too poor condition to provide lumber.

MOTOR EQUIPMENT

The motor equipment used on the watershed was kept in good running order and serviced at the headquarters garage. By revising schedules, mileage has been curtailed, thus reducing wear and tear on tires and equipment and restricting gasoline consumption to the lowest possible amount in cooperation with the Government's rationing program.

Because of inability to purchase new equipment, three (3) used scout cars were purchased from United States Army surplus to replace three (3) worn out units returned to City Garage.

The units purchased, 2 Dodges and 1 Chevrolet one-half ton carry-alls were of the high body type, in excellent condition and particularly adapted for use on the watershed.

CEDAR GROVE LABORATORY

The procedures of the American Public Health Association and the United States Public Health Service, supplemented by methods we find better adapted to our own supply, were followed in the laboratory. The latter methods serve the purpose of checking the former. The following samples from the various sources were examined during the year.

SOURCE	BACTERIOLOGICAL	MICROSCOPICAL	PHYSICAL
1 & 2 Lines at Great Notch	602	472	602
Cedar Grove Reservoir before Treatment	301	---	---
Cedar Grove Reservoir after Treatment	300	236	301
Belleville Reservoir Influent	200	---	---
Belleville Reservoir Effluent	293	214	301
Passaic at Belleville	298	208	297
South Orange Avenue Reservoir Influent	238	---	---
South Orange Avenue Reservoir Effluent	230	200	242
City Tap Samples	198	132	429
New Pipe Line Samples	4	3	3
Macopin Intake	50	49	50
Echo Lake Brook at Route 23	52	49	51
Canouse Brook at Route 23	52	49	50
Clinton Brook at Junction	52	51	52
Oak Ridge Brook at Junction	52	49	50
Cedar Grove Reservoir Proper	--	7	7
Canistear Reservoir Proper	--	2	2
1 Line at Pequannock Bridge	29	--	--
Complaints	30	42	31
Miscellaneous	23	35	13
TOTAL	3,118	1,703	2,401

In conjunction with the above tests, the following chemical constituents were determined, for defense purposes, to note any possible attempt at sabotage of the water supply:-

Source	Alkalinity	Chlorine Demand	Oxygen Consumed	Cyanides
City Taps	293	914	12	0
Raw Water	366	51	0	366
Total	659	965	12	366

ADDITIONAL ANALYSES

12 Complete Chemical Monthly samples of delivered Pequannock water.
3 Complaints were investigated during the year.
2 Water samples of Leakage on premises were examined Chemically & Microscopically
Experimental Tests were made during the year on Corresco Paint, Graphite Paint and Texaco Rustproof Compound in connection with its possible use on pipe lines.

Daily checks were made for free Chlorine residuals and pH values of all delivered waters throughout the year. All raw water streams were checked weekly for pH values in the laboratory, while further checks were made more frequently at the Macopin Intake Treatment Plant.

MICROSCOPY

Due to microscopical growths, the following streams and ponds were treated with copper sulphate to improve the aesthetic quality of the water:-

- Clinton Stream, below the dam, April 13 to May 4, for Synura.
- Oak Ridge Brook, May 16 to 21, for Algae Growths.
- Manouse Brook, May 16 to 21, for Algae Growths.
- Clinton Reservoir overflow, July 7 to 9, for Algae growths.
- Oak Ridge Stream, including Wallace Pond, July 7 to 9 and July 11 to 19, for Algae Growths.
- Macopin Intake - Anacharis made its appearance about July 14 in sufficient quantity to require removal. This Anacharis was removed manually from about the middle of July to about August 15, at intervals.
- Cedar Grove Reservoir, due to the presence of Synedra and Tabellaria, was recommended to be by-passed on August 3. This reservoir was treated on August 10, and again on August 16, for these microorganisms. The reservoir was again placed in service on August 22.

BACTERIOLOGY

Daily bacteriological tests were made of all waters entering and leaving the distributing reservoirs. Weekly tests were made on the raw water of the various streams in the watershed and in various parts of the City to note the quality of the delivered water.

Since May 12,1944, in order to conform with the new Ninth Edition of Standard Methods of Water Analyses of the American Public Health Association, Lactose Brilliant Green Bile was included as a confirming media, in addition to Eosine Methylene Blue Agar.

On August 3 and 4, a sudden change in the bacterial flora of Cedar Grove Reservoir water was traced to fish which had been caught in the outlet well and died.

Now that proper equipment, of sufficient capacity, has been installed at the Macopin Intake Treatment Plant, it has been possible to control the bacterial flora of the water during heavy runoffs.

CHEMISTRY

Complete monthly Chemical Analyses were made of the delivered Pequannock water throughout the year.

As a further check on the various chlorine plants, daily chlorine residual tests were made in the laboratory.

Following recommendations of the New Jersey State Defense Council and New Jersey State Department of Health, daily tests were continued for those chemical elements that may indicate any attempted sabotage to our water supply.

During the year 16 samples of unknown leakage water were examined chemically and microscopically to determine if the leakage was from our distribution system.

Experimental tests were continued further on Corresco Lacquer in connection with its use on water works structures. Immersion tests were made under various conditions and it was found that if the lacquer were given sufficient time to dry in a warm atmosphere, the odor of the solvent did not persist in the water. The screens at the East Gate House of Cedar Grove Reservoir were coated with some

f this lacquer and allowed to dry. They were placed in service on May 20th
d no odor was detected in the water. This lacquer is not recommended for use
coating the inside of the pipe lines because of the difficulty of drying the
ines sufficiently in order to remove odor.

Immersion tests were also made on a Silica Graphite paint for coating the
reens. This paint did not stand up under the conditions required and a strong
aint odor persisted in the water tested.

Immersion tests were also made on Rustproof Compound. It was found that
ile there was a slight oily odor from this material, it was not objectionable
the odor slowly disappeared. There was noted, however, an oily film on water
mples used, which could be considered objectionable. It is claimed that this
mpound dries hard but after some six months of observation it has not. It
uld be used only for limited service.

PURIFICATION - SANITATION

Chlorine residual tests were made hourly of the treated water at the
copin Intake and Valley Road Treatment Plants, while at Belleville and
uth Orange Avenue Reservoir Treatment Plants, tests were made every two
urs while the plants were in operation. The laboratory further checked
ese residuals daily.

Macopin Intake Plant - Chloramine treatment was resorted to throughout
year and the plant functioned very efficiently. With the transfer of a
vy weighing scale from South Orange Avenue Reservoir to the Intake, a scale
now available for each Chlorine Machine and better control of weights is now
ilable. It was not found necessary to use the plant to full capacity, hence
reserve of chlorine in the machines, if needs warrant its use, is available.

Valley Road Treatment Plant was in satisfactory operation throughout the
r, using straight chlorine. The plant remained in operation during the
iod Cedar Grove Reservoir was by-passed, for copper sulphate treatment, from
ust 9 to 22.

Belleville Reservoir Treatment Plant - This plant was placed in operation,
straight chlorine, on May 23rd. However, due to a defect in the machine,
tment had to be discontinued until May 25th. Treatment was then continued
il October 31st. It was not necessary to resort to the use of Ammonia at
plant during the year.

South Orange Avenue Treatment Plant - This plant was placed in operation,
straight chlorine, on May 15th. At 6:30 P.M. on July 13th, a leak oc-
red in a one-ton Chlorine container and the plant was shut down until 11:00
on the 14th. As a measure of safety, the use of 150 lb. cylinders was
rted on July 10th. An analysis of a sample of water which flooded a
lar at 175 Fourteenth Avenue showed that the water was from South Orange
ue Reservoir and on September 19th, it was recommended that the reservoir
hut down and inspected. The treatment plant and the reservoir were shut
on September 24th. On September 26th, the reservoir remained by-passed but
opened for partial filling and testing. The reservoir was cleaned and the
nry repointed where necessary. Chlorine was used while refilling and the
rvoir and treatment plant were again placed in service on October 12th.
tment at this reservoir continued until October 31st, when it was discontinued.
to bacterial flora, on November 4th the treatment plant was again placed in
ation, the treatment continuing until November 22nd, when it was discontinued
the balance of the year. The treatment plant at South Orange Avenue does
function as well as it should. This is in part due to the opening and closing

regulators at various times. These regulators affect the amount of water entering and leaking this reservoir so that no one Manometer is within the range of the amount of Chlorine required. Hence, there is uneven chlorine control at low flows, causing complaints of chlorine taste at times in the South Orange Reservoir level. Another machine should be installed at this locality, to take in both ranges, or a more accurate control of the flow of water should be had so that existing apparatus may be used efficiently.

Sanitary inspections were continued, as heretofore, on the Pequannock watershed by laboratory personnel.

WANAQUE SUPPLY

Daily microscopical, physical, bacteriological and chlorine reaction tests were made of the Wanaque supply at the Belleville Reservoir take-off as heretofore. Samples were further checked weekly in the distribution system.

For conservative and financial reasons, during the year various amounts of Pequannock water were added to Wanaque water at various points in the system. There being a great difference in the Hydrogen Ion value of the two waters, after a period of time complaints of dirty water were received in the laboratory.

TRANSMISSION LINES AND CEDAR GROVE RESERVOIR

The Transmission System comprises all the major aqueducts between Macopin Intake and the Newark-Elizabeth City Line. These are listed as follows as of December 31,1944:

30"	Cast Iron Conduit. Cedar Grove Reservoir Supply Line.	3,350 ft.
7'x7'	Concrete Tunnel. (Cedar Grove Reservoir).	3,000 "
30"	Steel Conduit. (Great Notch to Cedar Grove Reservoir, Cedar Grove Reservoir to Bloomfield Avenue Tower, Belleville Reservoir to Elizabeth, Alexander Avenue Connecting Aqueduct, Montclair and Bloomfield, N.J.)	37,702 "
30"	Steel Conduit. (Macopin Intake to Second River).	145,309 "
48"	Steel Conduit. (Second River to South Orange Ave. Reservoir).	5,013 "
48"	Reinforced Concrete Pressure Pipe. (Second River to South Orange Avenue Reservoir).	13,900 "
48"	Steel Conduit. (Compton Notch to Belleville Reservoir).	22,192 "
48"	Steel Conduit. (Second River Crossing and Keller Parkway to Davenport Avenue).	2,705 "
36"	Steel Conduit. (Belleville to South Orange Avenue Reservoir).	20,540 "
	Total	363,220 "
	Equivalent.	68.82 miles

To insure the proper functioning of these aqueducts, a maintenance and repair force is stationed at Little Falls Aqueduct Maintenance Yard; the nature of the work required of this force is as follows:

Operation of valves as required to effect shut-offs or changes in method of delivering water.

Construction and repair of facilities.

Unloading and delivery of chlorine containers.

Maintenance and repair of equipment.

Mowing grass, cutting brush and doing other maintenance work on the right way.

Repairing leaks in the pipe lines.

Overhauling and reconditioning valves.

Patrolling the pipe lines.

Servicing lanterns and fires in vaults and gate houses.

Reading meters and servicing pressure regulators.

Other miscellaneous work.

CHLORINE STORAGE AT MACOPIN

When the Second Service Command, U.S.Army, made an inspection of our plant, ey criticized from the standpoint of safety, the construction, layout and lo- tion of the Water Treatment Plant at Macopin Intake. To overcome their objec- ons, the chlorine containers which were stored in an inflammable frame shed joining the Treatment Plant were removed and work was immediately started on e construction of temporary chlorine storage skids in an isolated spot in the ters:ed. The site selected was the old George property on the road leading om Charlotteburg to Charlotteburg Dam. Considerable grading was required and large number of trees and bushes were cut down to make room for four skids each out 30 feet long. The skids were constructed at truck floor height so that lorine containers may be loaded or unloaded by hand. A frame shed was also ilt for ammonia cylinders. These facilities are intended only for tem orary e until a suitable storage building can be built. A tentative plan for a re-proof chlorine storage building has been prepared. The building would ve an inside railroad siding, space to store 60 one-ton containers, and would equipped with a modern overhead travelling crane. Safety equipment and tools handle and repair leaking chlorine containers would be provided. It is one the projects of the Post-War Construction Program of the Division of Water.

In this connection a rather extensive study was made of the handling and orage of liquid chlorine. The available literature on this subject showed a le variation of opinion as to the proper method of handling this material, es- cially leaking containers and cylinders. All the leading chlorine manufactur- , as well as government agencies and safety organizations, were asked for their inions on this subject and from these conflicting data an attempt was made to w a conclusion as a basis for a set of instructions to city employees when dling chlorine.

During the year 13 cars of chlorine were unloaded at Charlotteburg, 32 con- iners were hauled to Valley Road Treatment Plant and 5 to Belleville Reservoir.

The Second Service Command, U.S.Army, also criticized the lack of adequate re protection for the inflammable Treatment Plant building at Macopin. An ef- rt was made to install an electric-driven fire pump but the available electric wer is only single phase, which is not suitable for the size motor that was re- ired. A skid-pump was obtained from the OCD and installed in the Gate House. six inch pipe line was laid on top of the ground and suitable connections and es were provided. A test showed that two or more powerful streams of water uld be played on the building.

Two of the three dry feed chlorinators at Macopin Intake Treatment Plant e been repaired and placed in perfect operating condition by the Wallace & rman Company. The third machine will be sent in for repairs early in 1945. se chlorinators were in poor condition and some of the parts were missing. was decided to have these chlorinators in condition for immediate emergency in case of power failure at Macopin Intake.

CEDAR GROVE RESERVOIR - REPAIRS.

At the West Gate House one set of screens was overhauled. The bracing rods, rackets and bolts were so badly corroded they were unsafe. These parts were laced with new ones and the screens were thoroughly cleaned, wire-brushed and nted with two coats of red lead and a finish coat of Dixon's Flake Silica- phite Aluminum. All steelwork between the gate house floor and the level of water was cleaned and painted. The well walls were cleaned and white washed, the gate stems greased. Canvasses were hung to catch all the dirt and excess nt during these operations.

The woodwork in this building is beyond repair and it is proposed to remove all windows and doors and install new ones of steel designed to harmonize with the fine masonry work of the building.

The steelwork of the bridge at the West Gate house was scraped and painted with two coats of red lead and a finish coat of Dixon's Flake Silica-Graphite Aluminum #111. Several 3" x 8" floor planks were renewed. This work was done while the reservoir was frozen over. This eliminated the use of scaffolds and materially shortened the job. Canvasses were spread on the ice to catch all the dirt and excess paint.

At the East Gate House, all the pipes and valves were cleaned and painted. The walls were white washed on the inside of the building. Railings and floors were painted. The operating handle on the hydraulic valve was repaired and a new support for the bearing of the indicator was installed. A new steel door was made and installed on the vault outside the East Gate House. This replaced the old wooden door that had rotted away.

REPAIRS TO THE OVERFLOW DAM AT CABINTEAR RESERVOIR

This dam has been leaking for a number of years and while the reservoir was down last summer it was decided to gunite the back of it. The job was advertised and three bids were received; the lowest one being about $11,000.00. This amount was considered entirely too much and it was decided to make the repairs with our own men.

The work was started October 4th. An examination of the masonry showed that leakage was caused by the deterioration of the mortar, the stones being hard and in excellent condition. All loose and soft mortar was carefully chipped out by hand. Dust and chips were washed out by high pressure hose and the masonry was then carefully brushed with neat cement and pointed up with 1 to 1-1/2 mortar. The surface was then brushed with wet white wash brushes to remove trowel marks and smooth down the edges of the mortar. Later the entire surface was brushed with neat cement. The dirt against the back of the dam was trenched out for a depth of 18 inches for the entire length of the dam and the old pointing was found to be in good condition. The job was finished October 19th, at a cost of about $1500.

AUTOMOTIVE EQUIPMENT

A used 3-ton six-wheel General Motors truck was purchased from U.S.Army surplus at Fort Dix. It is a powerful truck and was purchased primarily to haul the 6" Morris pump powered by a Buda gasoline engine, whenever a large pump is needed to unwater an aqueduct. Heretofore no truck suitable for such load was available. The truck is used for other heavy work. The body was too narrow to take chlorine containers crosswise so it was widened by burning off the side-boards, inserting a seven-inch piece of steel plate on each side and widening the front and tail-board to correspond. Three one-ton containers can now be hauled at one time.

Truck 14-A was replaced by a Dodge 1-1/2 ton dump truck, known as 22-A. Truck 24-A has not yet been replaced. Car 11, Dodge coupe, is quite old and expensive to operate and maintain. It has gone nearly 75,000 miles and should be replaced.

A removable A-frame was constructed on truck 33-A for handling heavy material. It is made of heavy 2" pipe with suitable welded brackets for attaching to the truck.

Dents were removed and minor repairs made to the bodies, running boards and fenders of trucks 16-A, 33-A and 35-A. All three trucks were repainted.

A snow plow was purchased from Good Roads Machinery Company and mounted on truck 16-A.

Tail gates on trucks were painted with diagonal black and white stripes.

LEAKS IN PIPE LINES

During 1944 there were eight leaks in the pipe lines, as follows:

No.2 Line near the radio tower, about 100 yards north of Broad Street, 1/4" hole on the bottom quarter.

No.1 Line, 100 feet north of air valve #36 at Preakness, 1/2" hole on bottom of the pipe.

60" Cedar Grove Line. Grove Street, 50' south of Belleview Avenue, 1/8" hole on bottom quarter.

No.2 Line at the New Jersey State Home for Girls. 130' south of air valve #32, 1/8" hole on bottom quarter. This is cement lined pipe. Inside the pipe the lining shows a diagonal crack about 1/8" wide starting at a circumferential rivet seam and dying out in about six inches. The hole in the steel was about 1/2" in diameter and the crack in the cement lining passed over this hole.

No.2 Line about 2,000 feet south of Bossie Avenue, Belleville, 1/4" hole, top quarter.

No.2 Line at the rag mill about 300' south of Harrison Street, Nutley, 1/4" hole, top quarter.

No.2 Line near radio tower, about 100 yards north of Broad Street. 1/4" hole on bottom quarter. Near the other hole at the radio tower, above mentioned.

No.3 Line, Carrelrant Avenue between Ernest and Collins Street, 1/8" hole half way down on the pipe.

60" manifold at West Notch crossovers, 1/4" hole half way down on the pipe.

A leak was reported on Fifth Street, Newark, in front of the Hooton Chocolate Company building. The leak detection crew found that it was an old pipe under the sidewalk, not the property of the City.

VALVE MAINTENANCE

At 5th Street and Davenport Avenue, Newark, a 12 inch valve, #702, was found to be inoperative due to the gears being jammed. This valve is very deep, being connected to the 42 inch line that passes under the City Railway near this point. The valve was dug up, repaired and a brick vault constructed in place of the street box.

Several other valves were found to be inoperative due to the valve boxes being full of stones. These were cleaned out and the lids repaired with new pentagonal-head bronze studs. One hundred (100) new boxes and lids were ordered. After receiving 25 boxes on a partial shipment we requested the Bureau of Central Purchase to cancel the order because the castings were defective and we did not have the labor to do the necessary chipping and grinding. There are many more that need to be replaced. Retapped 50 boxes and installed new pentagonal-head bronze studs on No.1 and No.2 Lines.

Four 48 inch valves in gate houses were cleaned and painted above the floor line with two coats of red lead and a finish coat of Dixon's Flake Silica-Graphite Aluminum #111. The packing glands were checked and tightened where necessary.

The valves and flap-gates at Oak Ridge Reservoir were cleaned and painted.

steam were greased and three of the valves were operated. The fourth valve inoperative.

Thirty-seven (37) air valves were overhauled during 1944. See 1943 Annual rt for details of this work. Fifteen (15) air valves were cleaned, scraped, -brushed and painted with two coats of red lead and a finish coat of Dixon' te Silica-Graphite Aluminum #111. Outlet pipes were repaired where necessary. -hole lids and stand pipes were cleaned and painted. The finish coat was Oil#9. ir valve at Lower Notch required a new bowl and cage to replace ones that were ked.

Located a buried blow-off valve on No.1 Line 121 feet south of the air es at Yantacaw Brook, Little Falls. This valve had been covered for many rs. A new jacket was installed and a street box was placed at ground level.

One hundred thirty-eight (138) blow-off valves were operated and flushed. e were on all lines, including the 60" line from Belleville to Elizabeth.

NEW MAINTENANCE BUILDING AT LITTLE FALLS

An extensive study was made of the operating requirements of the aqueduct e at Little Falls, from which there was prepared a proposed layout of an o-date, well-equipped, fire-proof building to take the place of the present -shift and inadequate facilities now existing. The proposed building pro- s garage space where trucks and cars could also be properly serviced, and an uate shop and storage room, with all facilities laid out in an integrated plan s to save operating time and expense. The building would present a neat, neatlike appearance and the grounds would be graded and landscaped. This ding is badly needed now and is proposed as one of the first projects of the -Year Construction Program of the Division of Water.

PAINTING CONTRACT

Specifications were prepared for painting the gate house, reservoir attend- s house and the treatment plant at Macopin Intake, the foot bridge at the C.O. se, store house and office at Little Falls, the laboratory and the reservoir e at Cedar Grove, the reservoir attendant's house and fences at Belleville and Valley Road Treatment Plant. Due to the lateness of the season it was de- d to postpone this work until 1945. This contract is to be advertised and as soon as possible in the early part of 1945.

IMPROVEMENTS OF RIGHT OF WAY

Part of the right of way between Macopin Intake and Belleville is graded gh to permit power mowing. A large part of it is so rough as to be mowed by hand. A Ford-Ferguson tractor with grading equipment and a mower attach- has been ordered and the right of way will be graded as time and available r will permit. Arrangements have been made to erect permanent markers for low-off valves between Macopin Intake and Belleville. There are 104 such s. Each one will have an individual marker consisted of a 4" x 6" steel e on which is welded brass letters and numerals indicating the number of the line and the number of the blow-off valve. The plates will be welded to a support set in a concrete base on the right of way line, if the ground is l, or at the top of the slope if it is on an embankment, opposite the valve. dition to making the right of way easier to maintain these improvements will tly add to the appearance of the City property.

At Trout Brook and at Ryerson's Swamp, the steel pipe lines make unsupport- ossings of small streams; the spans being 12, 13 and 16 feet. The steel

gas were originally covered with wooden enclosures but these enclosures have
tted and are very unsightly. It is proposed to remove these old wooden
closures, paint the outside of the pipe lines, cut bridge seats in the masonry
lls and span the openings with I-Beams encased in concrete and carrying a rein-
rced concrete road slab.

Suitable padlocked chains across the right of way will prevent trespassing.

MISCELLANEOUS

Concrete reference monuments, for locating valve boxes, were set at
ttenden Road and in the Brookdale Golf Course at the end of the 60" Alex-
der Avenue Connecting Aqueduct. (See Suburban Details #55 and #5)

About 800 lineal feet of open tile drain were laid in the Brookdale Golf
rse from Broad Street, Bloomfield, to the end of the 60 inch Alexander Avenue
nnecting Aqueduct. This area had been swampy for years and was the cause of
erous complaints from the golfers. It is now entirely dry.

An additional 8 inch blow-off valve was installed at the end of the 60 inch
xander Avenue Connecting Aqueduct at the Brookdale Golf Course. A brick pier
s built to support the valve and the brickwork under the man-hole cover was
ised.

A 6 inch hydrant was installed on #2 Line at the south end of the store
se at Little Falls and 1 inch taps were made on #1 and #2 Lines for the wash-
m and 1 inch tap on #2 Line for office at Little Falls.

The new men's wash room at Little Falls was completed.

City forces removed old trees in the yard at Little Falls, removed some of
excess second-hand material stored there and seeded several grass plots. An
fire building was also removed and a new greasing pit built in the store
se to replace the old outside pit. New air compressors and pressure greas-
equipment was installed. Faulty electrical wiring in the storehouse, which
been condemned by the Fire Underwriters was corrected by the Contractor, a
220 volt circuit for compressor motor was installed and electric cable laid
erground between the office and the store house.

At Great Notch cross-overs the valves have individual sheet steel valve
es about 16 inch in diameter. For several years these boxes have been rusting
ough, permitting dirt to wash down onto the gears, sometimes completely cover-
them. During 1943 many of these boxes were equipped with concrete curbs ex-
ing above the ground about 8 inches. This work was completed in 1944.

For years considerable trouble has been experienced due to man-hole covers
air-valve vaults being below the level of the ground. Water would accumulate
the metal lid and frame, causing them to rust through. Dirt was then washed
o the vaults causing expense and inconvenience to keep them clean. This
uble was overcome by raising the frames and covers at the following points:

No.2 Line at Aunt Sally's Hill. Two air valves.
No.1 Line at Aunt Sally's Hill. Two air valves.
16 inch cross connection at Aunt Sally's Hill.
Hog Miller Road. #2 Line. New cover installed.
South of Heller Parkway.
South of Park Avenue in Branch Brook Park.
42 inch line south of wye connection in Branch Brook Park.
60 inch line. Manchester Place at Grafton Avenue.

Below Great Notch crossovers.
No.2 Line at New Jersey State Home for Girls.
No.2 Line at Preakness Dairy Farm.
No.1 and No.2 Lines. Hackensack Lake.
There is much more of this work yet to be done.

Four gate houses were painted inside. This work was done when it was o stormy to work outside. Vaults at Pompton Notch and Poole's were painted. e overhead track for the chain hoist at the Upper Gate House at Macopin was moved and stored at Little Falls. The screens at the West Gate House, Cedar ove Reservoir were cleaned ten times during the year.

Several tons of weeds were removed from Macopin Intake Reservoir. Wooden oats which support chain drags are towed by motor boats. The weeds, which llect on the chains, are pulled up on a floating platform and thrown over the e of the dam. The wooden floats have been unsatisfactory due to getting ter-logged. New steel floats are being made and will be placed in service xt summer.

The steel lines between Macopin Intake and Newark-Elizabeth city line are crolled each week. The crew is divided up and assigned to various sections the lines.

The practice, started last winter, of heating only those vaults and gate ses that actually need heat was continued.

Cedar Grove Reservoir was by-passed for copper sulphate treatment from ust 9th to 22nd.

Water meters are read each month at Wayne, Hackensack, Pequannock and rbrook.

The water pressure at Hackensack Lake regulator was checked each week roughout the year.

A test of gunite pipe lining was made at the Passaic Valley Water Com- sion yard at Little Falls. The Pressure Concrete Company was doing gunite k at that point and one 7-foot length of new 48 inch steel pipe was taken r to the yard and lined with gunite.

CEDAR GROVE RESERVOIR - REGULAR OPERATION & MAINTENANCE.

At Cedar Grove Reservoir daily records were kept of reservoir elevations, water drawn from the reservoir and the weather, including maximum and minimum peratures, the amount of rainfall and snowfall, the amount of snow on the und and evaporation. A copy of these weather reports are sent to the U.S. ernment Weather Bureau Office at Albany, N.Y., each month.

Shore patrol and boat patrol around the reservoir, when possible, was e weekly, at which time the condition of the shore line was noted.

The upstream and downstream faces of the dams were mowed every two weeks ing the growing season as was also the flats adjoining the dams. The shore e at the North and East side of the reservoir was mowed for a distance of about feet from the water edge.

In the fall of the year fallen leaves were burned inside the fence on the t side of the reservoir and in the gutters along Ridge Road and Reservoir ive; the brush and grass inside the fence at the North end was mowed and rned, the trees which had been felled by the storm were removed and the grass the shoulders of Ridge Road and Reservoir Drive was mowed when necessary.

On August 9th, the reservoir was bypassed and treated with Copper Sulphate lied in solution throughout the reservoir. On August 23nd the reservoir was ain placed in operation.

In October, the drains around the Laboratory were relaid with 4 inch and inch tile. Formerly these drains led to sump holes, one located 20 feet north the building and another 20 feet south of the building, but these sump holes came filled with earth, and water eventually drained into the cellar of the boratory. The leads to the sumps were broken and new drains were run to the ds west of the building.

VALLEY ROAD TREATMENT PLANT - OPERATION

This Plant was in operation for the whole year, treating approximately million gallons daily with chlorine in amount of 0.5 P.P.M. maximum and 0.3 .M. minimum; chlorine residual averaged 0.25 P.P.M. and 32 one ton tanks chlorine were used.

Hourly readings were taken of the total flow through the Venturi Meter, te of flow per 24 hours through Venturi Meter, pounds of chlorine per 24 urs, and chlorine tank weight loss. Daily readings were taken of total w through Venturi Meter and of temperature.

Daily operating reports were made out covering every hour and submitted Cedar Grove Laboratory.

D I S T R I B U T I O N

During the year 1944, only immediate necessary expenditures by Division of ter forces, for construction and maintenance work in the Distribution System, re made.

Budget figures for maintenance work were again held to a minimum.

All main extension and maintenance work in the system during the year, done with Division of Water forces.

The following is a summary of the most important work done during the year.

Mains Laid - General Purpose Supply - Low Pressure System

Started 1944	Completed 1944
Homer Street from Haynes Avenue southerly to plant of U.S.Steel Supply Company	897 - 12" Cast Iron Main

Mains Laid - Special Segregated High Pressure Fire System

- - N O N E - -

Severe restrictions were continued by the War Production Board, Office of Utilities, on the use of critical materials by Utilities in order to conve all possible for use in the war effort. (See modification of Ruling which llows.)

Main extensions and replacements and also service extensions and replacets of large size, were all made subject to application to and approval by War Production Board.

Various governmental forms were filed by us, as ordered; these included rterly reports on deliveries, withdrawals and inventories of transmission distribution materials and quarterly records of excess inventories of these rials, for use by other utilities; all as required by W.P.B. Utilities Order (with amendments). On September 25,1944 the office of War Utilities, War uction Board, eliminated the 1944 - Fourth Quarter Return.

During the year the War Production Board, recognizing the cooperation of rworks in curtailing use of fundamental war materials and adoption of mutual plans, increased its aid to, and, at the same time relaxed somewhat, its rol over utility operations, in the knowledge that greater latitude allowed d be wisely administered. As a consequence War Utilities Order U-1 was ded on August 31,1944 to permit minor and major plant additions where net rials costs do not exceed $10,000.00.

The Division section crews carried on, as work schedules would permit, their lar inspection, maintenance and repair on gate valves, hydrants and pressure lators throughout the system.

One major break occurred during the year, on Thursday, July 20th, this ing a split pipe on the 10 inch low pressure cast iron feeder on Prelinghuy- n Avenue at Reddie Street. The break was a gradual one, causing a pressure op in the low level district.

Division forces made repairs and the main was restored to service on the llowing day.

The main at this location extends through the side walls and through the of structure of the main Reddie Street outfall sewer. Excessive vibration m heavy trucks, transmitted through the pavement and roof structure of the er to the cast iron pipe wall undoubtedly was the cause of the pipe failure.

The regular weekly inspection and maintenance of all recording instruments gauges was continued during the year.

All records were kept up to date, as usual, during the year.

Inspection survey of all service curb boxes in the city was continued but air notices were sent to owners only where sidewalk repairs or replacements been ordered by the Street Department. This matter was the subject of a ference with Assistant Corporation Counsel Schotland and the writer on July 1943. The general purpose of the discussion was to determine what the re policy of the Water Department should be with reference to continued ection and repair of the iron curb boxes over water service connection t-offs, in order to preclude damage claims involving alleged personal injur- sustained in tripping and falling over these appurtenances.

Counsel was advised that, as a result of continued city-wide inspection and sending out of form notices to property owners calling attention to boxes in ate of disrepair and requesting that repairs be made either by their own bers or by Division of Water forces at fixed rates, in many such cases the sion of Water had been authorized by the owner, over his signature on the rned form notice, to make the necessary repairs, but, because of the extent he work, our forces had fallen behind on repairs.

Counsel advised that the inspection work be continued but that no further ces be sent to owners until Division of Water forces had caught up with irs.

Operation Sheets and Sectionalizing Diagrams for the larger mains were re- d where necessary to keep them up to date.

Routine periodic inspection of all valves in the system was continued.

MISCELLANEOUS

e in Pressure Zones - Because of insufficient water pressures, the lle Sub-Cedar Grove Pressure Zone (Water Table Elevation 300) was extend- July 11,1944, to include the area between First and Hudson Streets and en West Market Street and City Railway. The water pressures in this ded area were increased from low thirties to fifty pounds per square inch.

Orange Avenue Reservoir - The persistent flooding of the basement in remises at 175 Fourteenth Avenue, adjacent to the reservoir, led to sing of the reservoir and drawing down the water level for the purpose termining whether leakage from the reservoir was causing this basement ng.

Water through an old tile drain, leading from the southeast corner of the reservoir embankment into an intercepting storm water sewer manhole in the northerly sidewalk area on Fourteenth Avenue, was found to be backing up from the manhole into the basement, because of stoppage in the main sewer on Fourteenth Avenue.

The water level having been lowered materially, it was decided to drain and clean the reservoir. This was done, including pointing up of the masonry in the southeast corner. The offending drains were cleared and after sterilization the reservoir was restored to service on October 12,1944.

DISTRIBUTION SYSTEM - GENERAL

The total length of water mains of various diameters owned by the City in the General Purpose Supply-Low Pressure System, including transmission mains is now 533.66 miles and in the Special Segregated High Pressure Fire System, 29.03 miles.

Connected with the mains in the general purpose supply or low pressure system are 4,404 fire hydrants and in the high pressure system 39[illegible].

There are 3,661 gate valves which control the flow of water in the mains of the low pressure system and 205 gate valves controlling the flow of water in the high pressure system.

There are 71,[illegible]00 water service connections, designated as "Services" in the low pressure system of which 53,067 are in use. Through these, water for domestic, commercial, public and fire use is drawn.

There are 317 water service connections in the high pressure system of which 253 are in use.

The water pressures in the low pressure system range from 30 to 130 pounds and in the high pressure system from 100 to 160 pounds per square inch.

MAIN EXTENSIONS AND REPLACEMENTS - GENERAL PURPOSE SUPPLY-LOW PRESSURE SYSTEM

The total amount of mains extended in the system during the year 1944 was as follows:

807 lineal feet - 0.17 miles of 12 inch diameter - cast iron.

The amount of work done in main replacements during 1944 was as follows:

N O N E

The total amount of pipe of different diameters in the system, at the end of the year 1944, deducting old pipe taken out, adding new pipe laid and adding new pipe of larger size in place of old pipe removed, consists of 2,923,438 lineal feet or 553.63 miles. (Itemized as shown).

4"	Diameter	Cast Iron.....	51,864 feet
6"	"	" "	1,294,102 "
8"	"	" "	463,994 "
10"	"	" "	91,773 "
12"	"	" "	296,090 "
14"	"	Wrought Iron.....	517 "
16"	"	Cast Iron.....	24,282 "
20"	"	" "	23,475 "
24"	"	" "	102,873 "
30"	"	" "	40,461 "
36"	"	" "	53,496 "
36"	"	Steel	20,540 "
42"	"	Cast Iron.....	343 "
42"	"	Steel	34,997 "
48"	"	Reinf.Conc.Pressure Pipe.....	13,208 "
48"	"	Steel	164,330 "
60"	"	Cast Iron.....	3,300 "
60"	"	Steel	87,732 "
TOTAL			2,923,430 feet (553.66 miles)

The number of low pressure service connections made during the year was 18, listed as follows:

82 - 1 inch diameter
7 - 1-1/2 inch diameter
19 - 2 inch diameter
2 - 3 inch diameter
3 - 4 inch diameter
5 - 6 inch diameter

The total number of existing low pressure services in the system at the end of the year 1944 was 71,229 while the number of services in actual use was 54,967. The difference shows the services installed in advance of street improvements.

During the year 11 low pressure hydrants were set. Of these 7 were replacements of old hydrants and 4 were additions to the number already in place; 3 hydrants were taken out and not replaced, making the total number of hydrants in the low pressure system as follows:

In the City.....	4,435
Silver Lake Section and Belleville...	49
Total.....	4,484

MAIN EXTENSIONS, HIGH PRESSURE FIRE SYSTEM.

No high pressure mains were extended during the year 1944.

The total amount of high pressure pipe of various diameters in the system December 31,1944 was as follows:

153,201 lineal feet.....29.03 miles (Itemized as shown).

6"	Diameter	Cast Iron	515	feet
8"	"	" "	7,574	"
12"	"	" "	60,617	"
16"	"	" "	44,219	"
20"	"	" "	23,764	"
24"	"	" "	2,563	"
30"	"	" "	5,029	"

TOTAL.....153,[illegible]1 feet (29.03 miles)

The total number of existing high pressure services in the system at end of the year 1944 was 317 while the number in actual use was 250. The difference shows the services installed in advance of street improvement.

1 high pressure service (4 inch) was installed during the year 1944.

During the year 1944 no new high pressure hydrants were set; none were replaced and none taken out, leaving a total of 392 high pressure hydrants in the system.

REGULAR MAINTENANCE - SPECIAL CREWS

Eight (8) breaks on mains were repaired and a total of 2,906 leaks, covering mains, hydrants and services, were investigated and, when necessary, repairs were made.

1,405 poor pressure complaints were investigated and 43 service taps were cleaned out or replaced at the main.

1,123 curb boxes were replaced with new ones or repaired and 55 curb stops were replaced.

During periodic inspection over the system, a total of 1769 valves were operated and inspected.

106 valves were repaired and 6 replaced.

103 valve street boxes were repaired and 36 replaced.

A total of 1700 hydrant repairs were made, most of which were necessary because of improper and unauthorized use of hydrants.

PLUMBING INVESTIGATIONS

Special surveys of water pipe lay-outs in manufacturing and industrial plants and service connections to buildings, were continued during the year and new records in the form of maps were completed and others brought up-to-date.

Numerous omitted accounts were added to the records where water services marked in ledgers "dead or water off" were found alive and in use. Numerous leaks were investigated and corrected as well as other irregularities.

Special investigations were made of all unmetered high (884) and low (172) pressure fire supply water systems, in the City, comprising a total of 1060. Comprising these 1060 fire supply water systems, there are 964 service connections; 794 in the low pressure and 170 in the high pressure systems.

In addition to the above listed unmetered fire systems, there are at present, in the system, a total of 119 metered fire supply systems. In this total 35 are connected to the high pressure only; 48 to the low pressure only and 36 are dually connected to both high and low pressure systems.

In addition, there exist twelve (12) metered service connections and four (4) unmetered service connections, for general use only, off high pressure city mains.

Inspection was made of all new services as to their proper installation, also of all repaired and relaid services.

Sixty (60) demolitions were reported to the Division of Accounts for their turn-off records.

Inspections were made and reports forwarded to the Accounting Division on 86 unmetered assessed accounts.

There were 500 complaints investigated, reported by property owners and licensed plumbers; most of these complaints were of unlicensed plumbers and other unauthorized persons tampering with water meters, installing or repairing water piping and digging at water curb boxes without proper permits.

In addition to the above, the following work was accomplished during the year:

Out of Town Meter Readings	1121
Meter Inspections	2256
Service Inspections	463
Special Investigations	2294
Special Readings	2287
Mason and Building Inspections	5806
By-passes Sealed	130
Unmetered Fire Service Inspections	966
Tap Inspections	119
Surveys and Drawings - 65 - covering	264 Taps
Water Leech Inspections	113

Nineteen (19) water meters supplying other municipalities were read weekly.

Inspections were made and readings taken monthly on all 50 meters supplying water to U.S.Army Air Base at Port Newark and Weequahic Park.

Four Hundred and Eighty-Six (486) investigations were made of industrial plants, power plants, breweries, office buildings and other properties along the river front and elsewhere in the City, to locate water connections between the city water supply and private systems using river and well water for cooling and processing purposes and for air conditioning. One Hundred and Sixty-Two (162) wells were found in use and thirty-six (36) wells were recorded not in use, during the year; 4 river connections were found abandoned. Ten (10) such foreign connections were found and were removed under our supervision.

METER LABORATORY

The Meter Laboratory located at 332 South 8th Street, Newark, New Jersey, is responsible for the servicing and proper functioning of every water meter on Newark water services. It also keeps an invaluable record of each meter, giving in detail, its location, size, make and number and a record of all tests, repairs and charges from the original date of purchase, until it is scrapped.

Five Thousand, Six Hundred and Fifteen (5,615) meters were handled and rviced in varying degrees during the year, covering the range of sizes and kes in service, a detail of which work follows:

At Laboratory

326	damaged by frost
1733	stuck (various causes)
99	damaged by heat
410	new meters tested
314	meters tested for accuracy (no repairs necessary)

On Premises

917	inspections
66	special readings
74	tests (2" and larger)
324	major repairs (2" and larger)
723	minor repairs (glass,lids,reseals and leaks)

During the year, in the Laboratory,

1333 old meters were tested before repairs and
2274 old meters were tested after repairs.

472 old meters were condemned because of extreme wear, severe damage by frost or heat and obsolescence.

1770 meters were removed from premises to shop by Division forces.

1647 meters were reset in premises by Division forces.

1249 meters were removed from premises to shop by Plumbers.

1005 meters were reset in premises by Plumbers.

Meter repairs were again hampered during the year caused by delay in ocuring meter repair parts because of critical material shortages due to the r.

The stock room continued to function satisfactorily during the year. Meter rts and general supplies are in charge of one man, who is responsible for ir disposition and replenishment. He is also charged with the receiving of l material and the handling of shipping when necessary. All drafts made on e stock room must be properly accounted and charged for, preventing pilfering d enabling us to anticipate our requirements more accurately.

Periodic field testing of meters, 2-inch and larger was continued during e year by a special crew engaged on this work; periodic testing of smaller ters is carried on by the regular Meter Laboratory forces, as schedules and e permits.

The card system,listing the names and signatures of licensed plumbers,functoned satisfactorily during the year. This offers a complete check on the dling of all meters either new or reconditioned, over the signature of a gular licensed plumber, which is required under our rules and regulations.

Frequent unexpected checks are made of all water meters stored at the Meter oratory and since this procedure was inaugurated all meters have been accunted for.

Cooperation has been continued through conferences with and exchange of rly reports between the Accounting Division, Investigators; and the Meter oratory and meter testing crews.

DEPARTMENT OF PUBLIC WORKS

DIVISION OF WATER

NEWARK, NEW JERSEY

WATER SUPPLY STATISTICS

For year ending December 31,1944

****

Population by census, 1940	430,000
By whom owned	City of Newark
Source of Supply	Pequannock and Wanaque Watersheds
Method of Supply	Gravity

STATISTICS OF CONSUMPTION OF WATER

Population, City of Newark (Estimated 1944)	440,000
Consumption, for the year, City of Newark	22,008.1 m.g.
Consumption, for the year, Town of Belleville	894.6 m.g.
Consumption, for the year, Town of Bloomfield	1,772.9 m.g.
Consumption, for the year, Town of Elizabeth	2,846.3 m.g.
Consumption, for the year, Township of Wayne	86.5 m.g.
Consumption, for the year, Hackensack Lake	70.7 m.g.
Consumption, for the year, Verona, Overbrook Hospital	43.2 m.g.
Consumption, for the year, Elizabethtown Water Company	17.2 m.g.
Consumption, for the year, Commonwealth Water Company	110.5 m.g.
Consumption, for the year, Pequannock Township	3.2 m.g.
Total Consumption, for the year	27,964.0 m.g.
Passed through meters in the City	18,877.7 m.g.
Percentage of consumption metered in the City	85.54
Average daily consumption, City and Suburbs	76.3 m.g.
Average daily consumption, in the City	60.3 m.g.
Gallons per day to each inhabitant in the City	137.0

STATISTICS REGARDING DISTRIBUTION SYSTEM

- GENERAL PURPOSE SUPPLY SYSTEM -

Kind of pipe in distributing mains	Cast Iron, Steel and Concrete
Pipe sizes (diameter)	4 inch to 60 inch
Extended during the year	897 feet during year
Total length now in use (all sizes	503.03 miles
Number of hydrants added during the year	4
Number of hydrants discontinued during the year	5
Number of hydrants replaced with new or reconditioned hydrants	7
Number of hydrants now in use	4,424
Number of stop gates - valves - added during the year	2
Number of stop gates - valves - now in use	8,661
Range of pressures in distributing mains	30 to 130 lbs.

SPECIAL HIGH PRESSURE FIRE SYSTEM.

nd of pipe in distributing mains	Cast Iron
pe Sizes (diameter)	6 inch to 30 inch
tending during the year	None
tal length now in use (all sizes)	23.03 Miles
mber of hydrants taken out during the year	None
mber of hydrants replaced with new or reconditioned hydrants	None
mber of hydrants now in use	302
mber of stop gates - valves - added during the year	None
mber of stop gates - valves - now in use	285
nge of pressure in distributing mains	100 to 160 lbs.

CONSUMER SERVICES - GENERAL PUBLIC WATER SUPPLY SYSTEM.

nd of service pipe	Lead, Brass and Cast Iron
pe Sizes (diameter)	5/8 inch to 6 inch
tal number of services in the system, January 1,1944	71,243
tal number of services added during 1944	119
tal number of services abandoned during 1944	133
tal number of services in system, December 31,1944	71,229
tal number of services in use (other than fire line) December 31,1944	53,001
tal number of services in use (other than fire lines) metered,12/31/44	53,005
tal number of services in use (other than fire lines) unmetered 12/31/44	96
rcentage of services in use (other than fire line) metered, 12/31/44	99.84
tal number of fire line services in use, December 31,1944	870
tal number of fire line services in use, metered, December 31,1944	82
tal number of fire line services in use, unmetered, December 31,1944	794
rcentage of fire line services in use, metered December 31,1944	9.36

CONSUMER SERVICES - SPECIAL HIGH PRESSURE FIRE SYSTEM.

nd of service pipe	Cast Iron
pe Sizes (diameter)	1 inch to 6 inch
tal number of services in the system, January 1,1944	316
tal number of services added during 1944	1
tal number of services abandoned during 1944	0
tal number of services in the system, December 31,1944	317
tal number of services in use (other than fire line) December 31,1944	16
tal number of services in use (other than fire line) metered, 12/31/44	12
tal number of services in use (other than fire line) unmetered, 12/31/44	4
rcentage of services in use (other than fire line) metered, 12/31/44	75.00
tal number of fire line services in use, December 31,1944	242
tal number of fire line services in use, metered, December 31,1944	72
tal number of fire line services in use, unmetered, December 31,1944	170
rcentage of fire line services in use, metered, December 31,1944	29.75

E N G I N E E R I N G

AQUEDUCT CONSTRUCTION - SIX-YEAR PLAN

ALEXANDER AVENUE CONNECTING AQUEDUCT - The 60-inch Alexander Avenue connecting Aqueduct between the 60-inch Cedar-Grove Reservoir-To-Tower transmission line and the 42-inch and 48-inch Pequannock lines from Great Notch to the City was in service throughout the year. Observation just before the line was put in service late in 1943 showed leakage in excess of the customarily allowed rate of 1 million per day per linear foot of pipe line. As the final construction procedure on this pipe line, the Bituastic Enamel lining was repaired and completed and made continuous from end to end of the line by the Johns-Manville Corporation during November 1943. A two-year guarantee goes with this work. The examination of this lining before the expiration of this guarantee will afford an opportunity to carefully inspect the interior of the pipe at each joint and to attempt to locate any leakage which may exist at joints. Because of heavy consumption during 1944 in the City the line was not shut down for test or examination.

RELINING 42-INCH NO.2 PEQUANNOCK PIPE LINE - POINTVIEW TO GREAT NOTCH.

The 42-inch No.2 Pequannock pipe line was cleaned and lined with cement mortar placed by the Centriline Corporation, 140 Cedar Street, New York, in 1942 and 1943. Final estimate for the work was approved April 7,1943. This date then became the date of final completion of the work. The lining was guaranteed against all defects of materials and workmanship for a period of two years from this date. One leak occurred in this line immediately after it was put in service after being lined. It is assumed that pittings from the outside of the pipe perforated the steel, but was not discovered at the time the lining was placed, and that ground-water entered through the freshly-placed mortar of the lining, making a hole through which water leaked when the line was put under pressure. No other leaks have appeared. Although no tests of capacity have been made since those made in 1943 soon after the work was completed, indications are that the figure of 36.5 million gallons per day - to which it was then found that the capacity of the line had been increased from the former 24 million gallons per day limit - still obtains. The line is to be unwatered early in February 1945 for examination in accordance with the provisions of the guarantee so that repairs, if necessary, can be made before April 7,1945, the expiration date of the guarantee.

RELINING 42-INCH NO.1 PEQUANNOCK PIPE LINE - MACOPIN TO GREAT NOTCH.

No action having been taken on the recommendation of the Division of Water for that Contract 35 for the Cleaning and Lining of 20,000 Linear Feet of 42-inch No.1 Pequannock Pipe Line from Macopin Intake to the Great Notch Covers be awarded to the Lock Joint Pipe Company of Ampere, N.J., or that bids be rejected and a part of the work be readvertised for a cement-mortar lining as per Contract 35 specifications or proven and approved equal, study of problem was resumed in April 1944 in an effort to complete at least a portion of the work in advance of the summer peak of consumption. Contract Docu-

nts for a new contract, Division of Water No.56, were prepared covering a rtion of the originally proposed line, 21,000 feet in length between Prospect enue Wayne, and Great Notch. The specification described the essential tures of the lining as placed by the Centriline machine and allowed other thod than Centriline's provided the resulting lining had the features des-ibed, and required.

On May 17,1944 all bids received March 10,1943 for Contract 55 were re-cted and authorization was obtained to readvertise for bids for Contract 56 above described.

The essential parts of the specifications for the lining as finally adopt-were contained in Paragraphs (41) and (42) of the Contract Documents as llows:-

1) CHARACTER OF LINING: The cement-mortar lining to be placed under this ntract shall have the following characteristics:

(1) The lining shall be uniform in thickness, except in the vicinity of joints, with a minimum of 3/8-inch and a maximum of 7/16 inch;

(2) It shall contain no sand pockets or other defects which may impair its strength and wearing qualities;

(3) At joints, rivet heads shall be completely and smoothly covered and there shall be gradual transitions between the uniform lining specified under (1) and the smooth lining covering the rivet heads, these transitions to occur in a length of not less than 9 inches;

(4) The surface of the lining shall have a smooth trowelled finish;

(5) The tensile strength in pounds per square inch of the mortar of which the lining is made shall be not less than 300 pounds per square inch at 7 days and 800 pounds per square inch at 28 days, as determined from test specimens made and tested in accordance with A.S.T.M. standard procedure.

2) PLACING OF LINING: As stated in Paragraph (31), the cement-mortar ning shall be placed by centrifugal machine, cement-gun or other mechanical ans which will produce the quality of lining required under these specifica-ons. By centrifugal machine is meant the Perkins machine, which has been d successfully to apply linings of a similar nature on other pipe lines of City. If the cement gun or other mechanical means is to be employed in cing the lining, then satisfactory demonstration shall be made to the Engi-r that such method will produce results the equal of those produced by the ntrifugal machine in similar pipe lines of The City of Newark, New Jersey, that the work can be completed within the time limits established in Para-ph (3) of the Contract Documents.

Contract Documents also required that the work be completed in seventy-five) working days but provided that the work might be suspended if necessary ring the summer of 1944 if increase in use of water made this necessary.

Contract 56 was advertised on August 3,1944 for bids to be received on ust 15th. Five bids were received as follows:

Joseph Besto & Co.	$2.49	per foot	=	$52,290	total	for	21,000 feet.
Spiniello Constr.Co.	2.76	" "	=	57,960	"	"	21,000 "
Centriline Corporation	3.50	" "	=	73,500	"	"	21,000 "
Marinucci Bros.	4.15	" "	=	87,150	"	"	21,000 "
Christie J Leiser,Inc.	4.31	" "	=	90,510	"	"	21,000 "

bidders except Centriline Corporation proposed to place the lining by the ment Gun."

Joseph Nesto and Company were again lowest bidder with a bid even lower an their bid of $3.50 per foot in 1943 for Contract 55 and about 80,000 near feet of line. They stated that they proposed to use the method which e Pressure Concrete Company of Newark had demonstrated in August 1943 in nnection with the Contract 55 controversy and that the Pressure Concrete mpany would direct and supervise the work of lining the pipe. This method oots "Gunite" onto the walls of the pipe at least to the required thickness the lining and after an interval of about 3 hours scrapes the material down the required thickness and trowels the surface to a smooth finish.

Since the demonstration of 1943 had not been carried to a conclusion as gards strength and quality of the resulting lining, the Nesto Company was rected to demonstrate its procedure so that careful examination and test of e lining could be made in accordance with the specifications before the con- act would be awarded. Demonstration was not forthcoming by late September d on September 21st the City Law Department notified the Nesto Company that definite arrangements for the test were not made within ten (10) days the ty would procure the work in accordance with the contract and specifications d charge the Nesto Company the difference between the final cost of the work d their bid.

Test lining was started on October 3rd and completed the next day in a 1/2-foot section of 48-inch steel pipe at the Little Falls Plant of the ssaic Valley Water Commission where the Pressure Concrete Company were plac- "Gunite" in a 18-foot penstock. The Jersey Testing Laboratory was engaged make the physical tests and to report and advise on the quality of the lin- g. Samples were taken of cement, sand, the dry mix, the gunite as shot onto e pipe walls and the lining after being scraped down and finished. From ese samples test pieces were made for 7-day and 28-day tests. Samples of the nished lining were also cut from the pipe and test specimens made for 7-day d 28-day tensile tests. All tests showed good strengths.

It was concluded by both the Jersey Testing Laboratory and the engineers the Division of Water that a lining to conform with the specifications of ntract 55 could be made by the method proposed by Jos. Nesto & Company, pro- ded sufficient care were given to the finishing. Recommendation was there- re made about November 15th that the contract be awarded to Jos. Nesto & Com- ny, the lowest bidder with reliance upon the Contractor's bond to require at the Contractor do what he has demonstrated he can do to produce the speci- ed lining.

Contract was awarded to Jos. Nesto & Company on December 27, 1944 and awaits ecution as of the end of the year.

UTILITY BUILDING AT CHARLOTTEBURG

In the early morning hours of December 3, 1943 fire destroyed the two rages, the pump house and other small buildings used as an office at the squanock Watershed headquarters at Charlotteburg. Plans for a new building take the place of those destroyed were started at once. Surveys of the te were made in January 1944, design of a building to combine office, garage d work shop was started about the first of February and Contract Documents r general construction, heating, plumbing and electrical work were completed April. These four contracts, Nos. 58-A, 58-B, 58-C and 58-D respectively re advertised on May 8, 1944 for bids to be received May 23, 1944.

Bids for this work were received on May 23, 1944 as follows:

Contract Number	Work	Number of Bids	Low Bid Amount	Low Bid Contractor
50A	General Construction	9	$25,000 *	Daniel J.Cronin,Inc.
50B	Plumbing	5	770	James F.Smith
50C	Heating	7	2,070	James F.Smith
50D	Electrical Work	6	10,070	Walter F.Messenger

* Exterior walls of concrete block. For brick walls bid was 28,000.

Appropriating ordinance to provide funds for this work passed final reading on June 21,1944. Following the lapse of the ten days during which commitment cannot be made legally against these funds, the various contracts were awarded on July 12,1944 to the respective low bidder as listed above, the award to the Cronin company being for a building with brick walls at the bid price of $28,000.

Ground for the building was broken late in July, cellar walls and footings of concrete were completed during August. Walls of brick and partitions of concrete blocks were placed and carpentry work was finished during September. Slate roof was placed, painting was practically completed and plumbing and electrical fixtures were installed in October. Heating boiler salvaged from the fire was rebuilt and reinstalled in the new building in October, radiators were installed during the first half of November and all work was completed on December 12,1944.

As of the end of the year 1944 final estimates of $28,000 for Contract 50A General Construction and $1,070 for Contract 50-D Electrical work had been approved for payment and final estimates were being prepared for Contract 50-B Plumbing and 50-C Heating.

REPAIRS OF CANISTEAR RESERVOIR OVERFLOW DAM

The low level of reservoirs resulting from the period of below-normal rainfall in the summer of 1944 afforded an opportunity to undertake long-contemplated, necessary repairs to the upstream face of the overflow dam at Canister Reservoir. As Project C-2 of a comprehensive construction program formulated in 1938, it was proposed to apply a 3-inch blanket of Gunite, reinforced with steel mesh, to the upstream face of the dam. The dam was built in 1906 of large blocks of quarried stone laid in cement mortar. Leaks had appeared in the downstream face of the dam and alternate freezing and thawing of the water from the leaks was disintegrating the mortar.

Oak Ridge Reservoir being about half empty early in September it was decided to try to take advantage of the opportunity, and Canisteer Reservoir was drawn down about 17 feet to expose the entire upstream face of the overflow dam. Contract 60 for Guniting the Upstream Face of Canisteer Overflow Dam was prepared and advertised on September 22nd for bids to be received October 3,1944. There was little interest in the job, it being small and inaccessible. Three (3) bids were received, the lowest being that of Lewis and McDowell,Inc. of New York City at $11,980. Although this figure was about the same as the $12,000 which had been estimated in 1938 as the cost of the work on the 1938 Construction Program, it was far in excess of a reasonable price for the amount of work found necessary as required under Contract 60. It was decided not to do the Gunite work, at least not at this time, but to make repairs with City forces, cleaning out the joints and cavities in the upstream facing - which was found to consist of rather small, irregular stones and not large blocks of quarried stone as in the downstream exposed face of the dam - and filling these spaces with cement mortar.

All bids for Contract 60 were rejected October 18,1944. The work was started by City forces on October 4th and completed on October 19,1944. The cost of the work was about $1800.

MECHANICAL SCREENS AT MACOPIN INTAKE GATEHOUSE.

It became evident in the fall of 1944, as falling leaves clogged screens in the gate house at Macopin Intake, that these screens, placed and cleaned by hand, would soon have to be completely rebuilt. For some time the installation of mechanical screens at this location had been under consideration. Study was started in late September of the replacement of the present screens with power-driven traveling water screens. It was found that such screens could be procured and installed for about $15,000 and that it was now possible to obtain the necessary electrical power to operate them. They would make it unnecessary to continue with the present procedure of screen-cleaning which at times when leaves are falling requires three shifts daily of 5 to 6 men.

Field inspection of the site, and also of the gate house at Cedar Grove Reservoir where such screens might also be installed some day, was made on October 24th with representatives of the Chain Belt Company. Detailed specifications for the screens at both Macopin and Cedar Grove Reservoir were prepared during November. Authorization to obtain bids for the screens at Macopin was obtained and specifications were submitted with requisition therefor to the Bureau of Central Purchase. Work was advertised December 6th and two (2) bids were received on December 14th. The low bid for furnishing and delivering screens was that of the Chain Belt Company amounting to $9450 which was accepted by the City on December 27,1944. Several months will be required for manufacture and delivery of the screens. Meanwhile existing screens were patched as made to do during the troublesome fall months, of 1944.

SUPPLY TO OTHER MUNICIPALITIES

BAYONNE - The City of Bayonne was supplied with water from the Wanaque System during the year 1944 at a price of $85.00 per million gallons but without formal written contract.

Discussion of the possibility of allowing Bayonne to acquire an interest in the Wanaque supply continued throughout the year. Following conference on July 1,1944 between representatives of Newark, Bayonne, North Jersey District Water Supply Commission and Passaic Valley Water Commission, the City Commission of Bayonne authorized their Director of Revenue and Finance to enter into negotiations with the North Jersey District Water Supply Commission for the purchase of a share in Wanaque. At a hearing on the matter at the Wanaque Headworks on May 23rd the Wanaque partners authorized the North Jersey District Water Supply Commission to discuss with Bayonne the possibility of that City acquiring 7-percent share in the Wanaque from Newark's 40.5 percent and agreeing to pay $85 per million gallons for all "overdraft" in excess of the 7-percent allotment. In an attempt to get an idea of the price which Bayonne would pay and Newark would consider, conferences were held on July 28th between Newark and North Jersey District Water Supply Commission representatives and on August 11th between Newark and Bayonne representatives. It was evident that there was wide difference of opinion as to what Bayonne should pay to establish itself at this late date - on the same basis as original Wanaque partners - as the owner of a 7-percent allotment to be acquired from Newark. Bayonne's idea seemed to be about $2,500,000 based on present-day interest rates. Newark's idea was about $5,000,000 based upon actual Wanaque-bond interest rates of about double the

esent 2 or 2-1/4 percent rates.

From all of the discussion there finally evolved what, from Newark's point view, seemed an equitable and logical determination of the figure. A mimeographed brochure was prepared dated October 2,1944 for presentation to the ty Commissioners and others giving a brief history of the Bayonne situation d outlining the various factors which combine to determine this price. At e request of the Mayor actual figures of Newark's idea of what Bayonne should y to Newark for a 7-percent allotment in Wanaque were prepared early in cember 1944. The figures, to date of September 30,1944 and closely approxited are as follows:

a. Interest actually paid by Newark on the Wanaque Bonds representing the 7-percent allotment to be acquired by Bayonne	$1,900,000.
b. Serial bond payments actually made by Newark on Wanaque Bonds representing the 7-percent allotment	915,000.
c. Wanaque operating and maintenance expenses on the 7-percent allotment	300,000.
d. Compound interest on the above three items (a),(b) and (c) at rates which have governed	230,000.
e. Lump-sum payment which will provide funds for Newark to continue to meet future interest and bond-retirement payments on the remaining outstanding Wanaque Serial Bonds, covering the 7-percent allotment to be acquired by Bayonne	2,430,000.
f. Estimated amount, with interest compounded at the same rates as in (d), which Newark would have been entitled to receive and retain from sales of Wanaque water since 1930 for Bayonne's requirements over and above the 7-percent allotment, had Bayonne been an original Wanaque partner for a 7-percent allotment	440,000.
Sum of Above	$6,215,000.
From which sum would be deducted	
g. A credit to Bayonne of the amounts with interest compounded at the same rates as in (d) which Newark has actually received from the sales of Wanaque water since 1930 for Bayonne's total requirements	2,150,000.
Amount which Bayonne should pay to Newark for a 7-percent allotment in Wanaque	$4,065,000.

There the matter rests at the end of the year.

BELLEVILLE - The Town of Belleville continued to be supplied with water from Rockaway supply of The City of Newark throughout the year 1944. As of the beginning of the year formal written contract covering this service was under discussion but agreement had not been reached. The Town was notified that, in the absence of an executed contract, it would be billed for water at $90 per million gallons starting January 1,1944, instead of $80 per million gallons as heretofore. The contract price was established at $85. per million gallons.

ntract was not executed by January 1,1944 and the Town was billed for water
90 per million gallons. It made payment for water used during the first
ur months of 1944 at $85. The City, being unable to get action from the
wn on the contract and the Town refusing to pay the entire amount billed for
ter used at $90 per million gallons, took steps in May 1944 through its Law
partment to serve notice that the water supply to the Town would be shut off
thin 90 days. Thereupon the negotiations were quickly concluded for a 15-
ar contract at a price of $85 per million gallons effective January 1,1944.
wark City Commissioners approved this contract and authorized its execution
the part of the City on August 23,1944.

BLOOMFIELD - Use of water in the Town of Bloomfield for the year 1943 again
ceeded 4.0 million gallons daily average, the amount of Bloomfield's Wanaque
nership that is exchanged with Newark for an equal amount of Pequannock water
r which, in addition, the Town pays $30 per million gallons. In accordance
th the Newark-Bloomfield water contract the Town therefor was billed for
0.9055 m.g. @ $100 = $30,090.55, in addition to 1464 million gallons @ $30
43,920.00) for the exchanged water, or a total of 1772.9055 million gallons
ed for which $74,010.55 was paid to Newark.

In connection with the exchange of waters, Newark pays Bloomfield's
are of Wanaque operating costs amounting to about $18,000 and receives from
les of water to Bayonne about $34,000 on account of the 4.0 million gallons
ily Bloomfield allotment. The exchange therefor nets $16,000 additional to
e advantage of Newark.

COMMONWEALTH WATER COMPANY - Through connections installed in 1942 at Myrtle
enue at 16th Avenue, Irvington, and by contract of June 17,1942 the Common-
alth Water Company took water from Newark from July 10, to November 22,1944.
total of 110.5 million gallons was taken.

Late in October representatives of the Company discussed the possibil-
y of using water through this connection at a greater rate than the 2 million
llon daily rate permitted by the existing contract. Flow tests were made on
tober 27,1944 which showed that pressures in the entire Vailsburg section of
wark would be reduced about 12 pounds per square inch if 3 million gallons
ily were to be taken through the Myrtle Avenue connection. These observations
re supplemented by flow tests made on November 17th in the vicinity of Avon
enue and South 20th Street which showed this to be a much better location from
wark's point of view, at which 3 million gallons daily of water could be de-
vered to the Company. Results of tests were discussed with Company represen-
tives but no decision was reached as to where the Company might install addi-
onal pumping equipment to take water from Newark in greater amount.

JACKARACK LAKE - Jackaraack Lake was supplied with water throughout the year
om the No.2 cement-lined Pequannock Aqueduct, flow in which was, in general,
ld between 30 and 31 million gallons daily to provide as much pressure as
ssible to the supply. Nothing was done by the Company towards the rearrange-
nt and restoration of the bypass around meter, fish trap and regulator. It
s rumored that the Company was negotiating with Wayne Township for the sale
the Jackaraack Lake system to the Township.

OPERATING STUDIES AND ENGINEERING

GREAT NOTCH REGULATOR - The regulator at Great Notch stood ready throughout the
ar to supply Pequannock water to the City via the No.1 line to Belleville in
se of emergency. Regulator was set to open at about 30 pounds but did not
en at any time. No.2 line between Great Notch and Belleville serving Milton
reet, Belleville and Carrabrant Ave., Bloomfield, was closed off at the Great
tch end and was supplied with water from the No.5 line from the Tower to
lleville but was otherwise isolated.

PASSAIC WATER TO CEDAR GROVE RESERVOIR - All Pequannock water for use in the City was delivered to the Cedar Grove Reservoir from Cascopin Intake through the No.1 and the No.2 Lines, each line operating independently with cross-over gates at Pompton Notch and elsewhere closed. Rate of flow in the No.2 line, reconditioned with a cement-mortar lining in 1943, was in general, held between 30 and 40 million gallons daily throughout the year for the accommodation of Passaic water which was supplied therefrom. Variations in draft to serve the needs of the City were taken care of in the No.1 Line.

Cedar Grove Reservoir was bypassed for copper-sulphate treatment from August 9 to August 22,1944.

PASSAIC WATER TO CITY FROM CEDAR GROVE RESERVOIR - Pequannock water used in the City was drawn throughout the year entirely from Cedar Grove Reservoir through the 60-inch Bloomfield Avenue Line and the Alexander Avenue 60-inch conduct connected only into the No.1 line to Belleville Reservoir. The No.2 line between Great Notch and Belleville Reservoir was connected, during the year, only to the No.3 line at the Belleville end to bring water from the lower to Clifton Street, Belleville, and Garrabrant Ave., Bloomfield.

RAW WATER - To lessen Newark's use from the Wanaque Reservoir, thereby adding to Newark's share of the revenue from sales of water to Bayonne, the delivery of 6 million gallons daily of Pequannock water from the No.3 Downtown Feeder in Branch Brook Park near Eighth and Clifton Avenues into the Wanaque system was continued from the beginning of the year. Three (3) million gallons daily of this was put into the 60-inch line to Elizabeth and 3 into the 30-inch line in Eighth Avenue to down-town Newark.

On February 17,1944 Wanaque partners met at Wanaque Headworks to consider an agreement with Jersey City for water which might be taken through the Boonton-Wanaque interconnection to conserve overflow at Boonton by pumping it into Wanaque. The State Water Policy Commission held a hearing on March 4th relative their order to the North Jersey District Water Supply Commission to divert 25 million gallons daily of water from Boonton into Wanaque. Because of practical operating difficulties and expense the Wanaque partners objected to this procedure. The North Jersey District Water Supply Commission on March 6th advised Water Policy Commission that it would undertake to pump 10 million gallons daily from Boonton, that the Passaic Valley Water Commission would pump an additional 5 million gallons daily from its Little Falls plant and that Newark would use an additional 5 million gallons daily of Pequannock water in the Newark area supplied with Wanaque water, provided the Water Policy Commission would permit the District Commission to hold back about 10 million gallons daily of "compensating" water which normally is permitted to pass the Raymond Dam into the Wanaque River below the dam.

Accordingly, as Newark's share of the program, on March 9th a small additional amount of Pequannock water was introduced into the Newark Wanaque line at Belleville which amount was gradually stepped up to 3 million gallons daily by March 15th and held to this figure until April 3rd. On April 4th another small addition was made to the amount of Pequannock water delivered into the Wanaque level, this time at Keller Parkway. These additions to the 6 million gallons daily in Branch Brook Park brought the total of Pequannock water delivered to the Newark Wanaque System to 10 million gallons daily which amount continued from April 4th to the end of the year 1944. A total of about 3,130 million gallons of Pequannock water was so used in addition to about 5 million gallons daily through Belleville Reservoir, making a grand total of about 5,000 million gallons.

Although Pequannock Reservoirs overflowed during April 1944 no Pequannock water was taken into the Wanaque Aqueduct through the Wayne interconnection because of difficulties claimed by the North Jersey District Water Supply Commis-

n in treating the mixed waters.

In the efforts of others to augment the Wanaque Supply, pumps on the ton-Wanaque interconnection at the west end of Wanaque Tunnel were started arch 10,1944. From then to March 30th about 5 million gallons daily of ton water was all that could be delivered by these four pumps whose capa- is rated at 25 million gallons daily. Engine trouble on the pumps made mpossible to operate more than one pump at any time.

Hearing on the Wanaque Budget for 1945 was held on December 7,1944 at h the following matters were discussed:

1. Wanaque Operating Budget for 1945 amounting to $396,457.30 of which 177,313.93 was Newark's share;

2. Replenishment of Capital Fund of 100,000, depleted by 33,062.15 principally for water-rights damages;

3. Refund of emergency fund balances;

4. Sale of bank securities in the hands of the North Jersey District Water Supply Commission as a result of 1933 bank closings.

Operating Budget was adopted; Newark questioned the assessment for ital Funds and awaits clarification of the matter; and approval of Newark given to the sale of the bank securities at prices which would return 63.43 to the City.

R SUPPLY LEGISLATION - Agitation for New Jersey Water legislation, which become an annual reoccurrence, again was started in January 1944 by Governor 's message informing the public that bills to prevent future water famine ady were in preparation and would be submitted to the legislature for study recommendation. Opposition to the Scott bill, 1943's legislative effort a State Water Authority, had resulted in the formation in the fall of 1943 he New Jersey Water Conservation Committee, a consolidation of the various rests opposed to the bill. This Committee - on which Newark had represen- ion - at a meeting in Morristown on January 20,1944, requested permission of overnor to discuss proposed water legislation with him and his water ad- rs.

On February 1,1944 a large group from this Committee conferred with tor Emerson L.Richards who had been designated by Governor Edge as his water ser. The Senator advised that the Scott Bill was dead and that new legis- on had been formulated but would be withheld for two weeks to give the Water ervation Committee an opportunity to furnish tabulated information showing sufficiency of present supplies. Such report was prepared at a meeting irector Byrne's office on February 11th, was submitted to Senator Richards was publicized . Because of this strong opposition neither the Richards s or other water bills were introduced during the year 1944.

ESS DIVERSION - Excess diversion charges for water taken by the City of rk from the Pequannock Watershed for the year 1943 were established by State Water Policy Commission at the rate of $2.50 per million gallons h has been in effect since 1940. The charge was $15,331.50 for 6,132.721 lion gallons of excess diversion.

ING & MCDONALD REPORT - Various matters recommended in the Burns & McDonnell port of April 20,1942 were considered during the year.

The combining of the Belleville Reservoir and South Orange Avenue Reservoir vels - which has decided advantages, but also various disadvantages - was dis- sed early in January with Mr.Bennet of the National Board of Fire Underwriters idental to his review of the Newark water system for the purpose of bringing Underwriters Report of 1933 up to date. In his opinion there is question as the desirability of change. In the opinion of the Division of Water the change made, should await the termination of the war.

The controversial question of the yield of the Pequannock Waters'ed as now eloped and the effect on the yield of the construction of a Charlotteburg ervoir, was studied at great length and to a conclusion during the year. ther study of costs of reservoirs of various sizes at Charlotteburg is neces- y before it can be determined whether or not the construction of a reservoir this location is economically sound.

ILIAN EMPIRE - The Joint Operations Board consisting of engineering heads the water-supplies of the North Jersey District Water Supply Commission, The y of Newark, The Passaic Valley Water Commission, Jersey City and the Hacken- k Water Company held meetings on five occasions during the year following ch inspection trips were made to various water plants.

Incident tests conducted by the Newark Defense Council monthly through ober, except in March, when practice was omitted, were participated in by ipment of the Division of Water. In general two trucks responded, each to incidents on each monthly practice. Practice tests were ended with the ber 1944 incidents.

ANT SPRINKLERS - During July 1944 twenty-nine (29) permits to use a fire rant with a sprinkler shower attachment for street bathing were issued. This ares with 27 in 1943. In spite of this liberal issuance of permits, hydrants illegally used without sprinkler attachment, causing large waste of water, very hot days. Such unauthorized use of hydrants should not be permitted, ticularly during the present war emergency when every effort is being urged ave water. The arrest and fining of those who operate hydrants illegally ld soon stop the offenses, but the authorities do not seem willing to do this.

SHING - As in previous recent years flushing of dead ends and areas where y water tends to accumulate was done during 1944 only upon receipt of com- int. Complaints were few in number, were scattered all over the City and the most part were the result of unusual disturbances in the distribution s caused by use of hydrants for basin cleaning or street bathing.

ENTION - WATER HEATERS - Experimentation continued during the with flexible-type, immersion, electric heaters to prevent the formation chlorine-ice (chlorine hydrate) in trays of the chlorinators at Macopin Intake. 0-watt heater of this type with monel-metal sheath was effective during ary and February 1944 in preventing the ice but it lasted only a few months the clorine solution in the tray. Special arrangements were made with the ican Instrument Company of Silver Spring,Md., for the making of a heater, a sheath made from fine-silver tubing furnished by the City. This heater immersed in the water in the tray of a chlorinator during the late summer fall of 1944 and appeared to be immune to the action of the chlorine in the r. Four 750-watt immersion heaters with silver sheaths were subsequently red, one for each of the other chlorinators at Macopin. They had not been ived at the end of the year. The one in use at Macopin was completely satis- ory during the unseasonably cold weather of December 1944.

At the Valley Road Treatment Plant the use of hot water from the existing -water system, mixed with the low-temperature water being fed to the chlorina-, has continued and has prevented the formation of chlorine ice at this station

K LOCATION BY INSTRUMENT - During 1944 a program of leak location by electrical t ment was inaugurated. A Universal Super-Power Water-Leak-Survey Instrument a Universal T-H Type Pipe Locator were purchased and received early in 1944. pitometer crew which tests large meters received special instructions in the of the instruments and practiced on several leak investigations which involved er complicated piping. In May this crew was augmented and split into two s each with an automobile, one crew of 3 men with equipment to test meters in e and the other crew of 2 men with equipment to detect leaks. This latter began a routine sounding of all hydrants in the City in this search for er leaks. Work was started in the North Newark area. By the end of the year portion of the City west of Broad Street had been covered and 3225 hydrants been sounded. Leaking hydrants to the number of 235 were discovered, cause the leakage in 132 cases being improper shut-down and in 93 cases being defec- valves, which were repaired. In conjunction with this hydrant survey 16 r leaks were discovered and repaired, 7 being on hydrant laterals, 8 on ser- pipes and 1 on a main pipe. As necessary, the routine work was interrupted 119 investigations of special leaks not readily located without the electrical ruments. From such investigations, 60 leaks were found and repaired, 22 on mains, 36 on service pipes and 2 on transmission lines. As the operators become expert in the use of the instruments not only has there been a saving ater from the discovery of hidden leaks but there has also resulted a large ng in cost of making repairs of leaks by reason of the fact that the leaks be located with exactness thereby reducing pavement cuts and excavations to inimum.

POST-WAR PLANNING

In the 1943 Annual Report of the Division of Water there was presented fly the post-war plan of the City of Newark relative to its water system. ay 1944 a tabulation of these post-war projects was submitted to the Newark ral Planning Board and the general details of each project was outlined with status of progress made on the planning of each. The proposed method of cing this work as far as possible out of surplus revenues anticipated during er years was also outlined. In 1944 the sum of $600,000 was set aside out ccumulated surplus revenues in a Capital Improvement Fund for this post-war . The proposed 1945 budget includes a similar appropriation. The Planning d indicated its approval of the program, especially that part of it which ides funds for the future work.

Additional work was done from time to time on this planning as follows: mates of quantities involved in the reconstruction of South Orange Avenue rvoir were prepared based on preliminary plans; final location of 30-inch duct on 14th Avenue to this reservoir was determined from field surveys and and profile was prepared; contract drawings for the reconditioning of the nch Cedar Grove Reservoir line to the Tower via Bloomfield Avenue and of the nch No.2 steel line from the Tower to South Orange Avenue Reservoir were pre- d for tracing; a proposed 60-inch aqueduct to supplement the present 60-inch between the east portal of Cedar Grove Reservoir outlet tunnel and the ander Avenue Connecting Aqueduct at Grove Street, Montclair was tentatively ted on a set of paper tracings from which contract drawings may be prepared ; and a chlorine-disposal vault for the Valley Road Treatment Plant was ied and a drawing prepared combining features of caustic-soda pit for emergency rgence of chlorine ton-container, and a system of spray nozzles supplied r with water for absorption of moderate amounts of chlorine gas from the st of the plants ventilating system or supplied with caustic-soda solution

ed to and sprayed from the nozzles for the absorption of large amounts of gas ase of a serious chlorine leakage.

REQUANNOCK WATERSHED PROPERTY HOLDINGS AND SUITS-OF-WAY.

In May 1944 it was decided to discontinue tax appeals to the State Board 943 tax assessments pertaining to the Requannock Watershed and pipe lines, pt those on buildings in Jefferson and Rockaway Townships. These latter still pending. Appeals on 1944 assessments in West Milford, Jefferson, annock and Rockaway Townships were made which resulted in cancellation of sments on buildings in Rockaway Township, affirmation of assessments in Milford and Jefferson Townships and reduction of assessment to $7,500 from 000 in Requannock Township. Appeals to the State Board of Taxation were d in November 1944 in cases where local assessments were affirmed or in- iciently reduced by County Boards following appeals to those Boards.

Study and preparation of records of property holdings continued throughout year. Property maps were compared with descriptions of holdings and differ- s were reconciled, where possible, using aerial maps as an aid in this work. rtant boundary corners were identified where possible and monumented.

Resurvey of buildings and contents of the Division of Water was made for rance purposes and where necessary the amounts of coverage were adjusted in rdance therewith.

In an effort to prepare an inventory of water-rights owned and acquired by City in connection with the construction of the Requannock supply or resulting sults for damages in connection with the operation of this supply, search of y records and Newark Law Department files were started during December 1944.

MISCELLANEOUS

In connection with suits against the City for damages caused by a break in inch cast-iron water main on Park Avenue at Fifth Street on July 16,1939, ity's Law Department was assisted in the preparation of it's defense in ry 1944. Suit for $20,000 by the Park Grill was started in Judge Bartshorn's s Pleas Court on January 24th. The case was adjourned but came to trial e jury on June 19, 20, 21 and 22,1944. Mr.George L.Astley handled the case he City. Messrs. C.F.Lorch and Roswell K.Roper testified as experts for the it was contended that the City was negligent in not shutting down the n pipe more quickly and in permitting the type of construction at the bend the pipe broke. Claim against the City was not allowed. This was but one y suits pending against the City as a result of the Park Avenue break, none of which came to trial following the decision in favor of the City in this one.

The interior of the reservoir attendant's house at Belleville Reservoir, ralemon Street, was redecorated during the year. Contract for this work repared in May, advertised on June 2nd and three bids were received on June Lowest bid was that of the Hayes Painting and Decorating Company of 2 ld Place, East Orange for $875.00. This bid was considered too high and s were rejected, following which the work was readvertised on a modified on September 15th, as Division of Water Contract 30 (Revised). Two bids eceived September 26th, the lowest being that of M.A.Anelens of Irvington 43.00. Contract was awarded to low bidder on October 4th, work was started er 13th and job was finished late in November 1944. Rooms were papered and d.

A water supply by gravity from Echo Lake stream for the chlorination at ...opin Intake was investigated in the fall of 1944. Survey was made and ...liminary layout and estimate of cost was prepared. It appeared too costly ... further consideration. Later in the year, however, the question of the ...d of water for washing the proposed travelling screens at Hacopin ...e House ... up for consideration and the matter was restudied. To meet the additional ...trical-power needs for motor-driven pumps to supply water for screen washing, ... Jersey Power and Light Company agreed to a rather expensive strengthening ... their service to Hacopin at their own expense. Three-phase current will be ...ilable. The idea of a proposed gravity water supply was therefor given up.

Study was made of an underground chamber housing electrically-operated ...anism for the 42-inch vertical gate valve at the East Portal of Cedar Grove ...ervoir Tunnel. Remote control from the Valley Road Treatment Plant is ...posed.

Further progress was made from time to time during the year 1944 on a new ... of drawings showing alignment, grades, appurtenances and present day highway ...nings and other physical features of the Pequannock Aqueducts from Hacopin ...Belleville Reservoir.

Contract documents were completed in October 1944 for the painting of ...opin and Valley Road Treatment Plants, of fences around Cedar Grove Reservoir ... Belleville Reservoir and of various other pipe-line structures. Because of ... nature of the work and the lateness of the season the work was postponed ...ll the spring of 1945.

A proposed oil-storage room to be located on the second floor of the main ...lding at 350 South Eighth Street was designed. Its location did not seem ...table and it was not built.

At the end of the year study was being made of a possible rearrangement of ... boundary between the Cedar Grove Reservoir Level and the South Orange Avenue ...rvoir Level of the Newark Distribution System for the purpose of eliminating ...essively high pressures in the Cedar Grove Reservoir Level and lower-than-...irable pressures in the South Orange Avenue Reservoir Level along the present ...iding line.

Late in November 1944 revision was started of the 11"x16" tracings, blue-...nts of which are in the hands of all foremen and other key operators to give ... locations of mains, valves and other appurtenances of the low-pressure dis-...ution system. At this same time work was resumed on maps of the streets of ...rk showing the buildings and the size and locations of all service pipes sup-...ing them. These maps had been started in December 1935 as Works Progress Ad-...istration projects but the projects were terminated when the work was about ...f finished.

In the consideration of the 1944 Budget early in January a memorandum was ...pared giving a general description of all of the activities of the Division ...ater. In the Budget $200,000 of surplus revenue was dedicated to a Reserve ... Capital Improvement. Objection was raised to this by critics of the Newark ... Commissioners who obtained a writ of certiorari in Supreme Court and judg-... on the writ was in favor of the City so that the item was not affected by ... action and included in the 1944 Budgetary appropriation.

Tentative 1945 Budget of the Division of Water was prepared during October ...4.

Quarterly reports of deliveries and inventories in accordance with War ...duction Board, Office of War Utilities, Utilities Order U-1 were prepared and

mitted for the quarters ending March 31, June 30 and September 30,1944. By vision of Utilities Order U-1 as of August 31,1944 these reports were discon-nued and report for the fourth quarter of 1044 was not required.

Inventory of all supplies and equipment of the Division of Water as of ember 31,1943 was completed and submitted early in January 1944. Inventory of December 31,1944 was in preparation at the end of the year.

Annual report for the year 1943 was started early in February 1944 and completed about May 1,1944.

[illegible] FOR YEAR ENDED DECEMBER 31, 1944

[illegible]tance Sheet - Public Util[illegible]

[illegible] Sheet - Cash or Budget Form.

CAPITAL SECTION

[illegible] & Depreciation Schedule -

[illegible] Disbursements.

[illegible]

[illegible]

[illegible]

OPERATING SECTION

[illegible] Receipts

[illegible]

[illegible] Disbursements..

[illegible] Operating Cash Balance

[illegible] Expenditures - Public Util[illegible]

[illegible] Account - Public Utility

[illegible] Earnings from Public Util[illegible]

[illegible] and Revenue - Public Utility

[illegible] Served - Territory Served

STATEMENTS FOR YEAR ENDED DECEMBER 31, 1944

1 - Comparative Balance Sheet - Public Utility Form.

2 - Balance Sheet - Cash or Budget Form.

CAPITAL SECTION

3)- Plant & Equipment & Depreciation Schedule - Public Utility Form.
4)

5 - Cash Receipts and Disbursements.

6 - Analysis of Capital Cash Balance.

7 - Capital Construction.

8 - Funded Debt Schedule.

OPERATING SECTION

9 - Dedicated Revenue Receipts.

10 - Budget Control Disbursements.

11 - Cash Receipts and Disbursements.

12 - Analysis of Operating Cash Balance.

13 - Earnings and Expenditures - Public Utility Form.

14 - Comparative Income Account - Public Utility Form.

15 - Adjustment of Net Earnings from Public Utility Basis to Cash or Budget Basis.

16 - Water Consumption and Revenue - Public Utility Form

17 - Water Purchased or Sold - Territory Served - Monthly Output - Misc. Data.

DIVISION OF WATER

BALANCE SHEET - PUBLIC UTILITY FORM

ASSETS

	Balance at January 1, 1944	Balance at December 31, 1944	Net Change during year
ked Capital	$ 47,931,811.88	$ 47,970,391.85	$ 38,579.97
terials and Supplies	127,569.88	132,955.65	5,385.77
sh	1,024,207.97	985,831.23	38,376.74
vestments of Capital Imp.Fund - U.S.Securities	-	600,000.00	600,000.00
crued Interest on ditto	-	1,125.00	1,125.00
nsumers' Accounts Receivable	615,039.46	664,890.75	49,851.29
her Accounts Receivable	34.00	-	34.00
epayments (Insurance)	3,235.42	904.28	2,331.14
nking Funds	3,121,941.66	2,682,400.45	439,541.21
	52,823,840.27	53,038,499.21	214,658.94

LIABILITIES

nded Debt	18,029,000.00	16,837,000.00	1,192,000.00
her Accounts Payable	106,353.58	90,017.03	16,336.55
arned Revenue (1945 Period)	2,982.06	76,317.81	73,335.75
terest Accrued	176,890.30	184,003.02	7,112.72
her Accdrued Liabilities	21,221.64	19,912.28	1,309.36
rtization (or retirement) Reserve	27,546,810.16	28,318,232.74	771,422.58
scellaneous Reserves	743,322.74	1,323,857.87	580,535.13
pital Surplus	5,827,827.48	5,785,257.84	42,569.64
rned Surplus	369,432.31	403,900.62	34,468.31
	52,823,840.27	53,038,499.21	214,658.94

DIVISION OF WATER

DEPARTMENT OF PUBLIC WORKS

NEWARK, N. J.

STATEMENT OF ASSETS AND LIABILITIES - DECEMBER 31ST, 1944

	CAPITAL SECTION	OPERATING SECTION	TOTALS
ixed Capital - Plant & Equipment	$ 47,970,391.85	$ -	$ 47,970,391.85
aterials and Supplies Inventory	-	132,955.65	132,955.65
ash	303,583.28	681,947.95	985,531.23
ash Change Fund	-	300.00	300.00
nvestments of Capital Imp.Fund - U.S.Securities	600,000.00	-	600,000.00
ccrued Interest on ditto	1,125.00	-	1,125.00
ccounts Receivable	-	664,890.75	664,890.75
repaid Insurance	-	904.28	904.28
inking Funds	2,682,400.45	-	2,682,400.45
mprovements Authorized and Uncompleted	287,646.77	-	287,646.77
	51,845,147.35	1,480,998.63	53,326,145.98
TIES			
unded Debt	16,837,000.00	-	16,837,000.00
ccounts Payable	11,110.00	28,929.21	40,039.21
ue to City Current Account	-	19.64	19.64
verpayment Account	-	420.91	420.91
944 Appropriation Reserve	-	44,762.27	44,762.27
eserve for Accounts Receivable	-	664,890.75	664,890.75
eserve for Inventory	-	132,955.65	132,955.65
eserve for Prepaid Insurance	-	904.28	904.28
eserve for Change Fund	-	300.00	300.00
eserve for Capital Improvement Fund	601,125.00	-	601,125.00
nterest Accrued on Bonds	-	184,003.02	184,003.02
npaid Payroll	-	19,912.28	19,912.28
mortization Reserve	28,318,232.74	-	28,318,232.74
ppropriation for Utility Building	4,775.00	-	4,775.00
ontractual Reserves - Imp. Auth.	287,646.77	-	287,646.77
orporate Surplus - Arising from Revaluation of Watershed - 1-1-13	5,780,431.33	-	5,780,431.33
urplus	4,826.51	403,900.62	408,727.13
	51,845,147.35	1,480,998.63	53,326,145.98

CASH OR BUDGET BASIS FORM

DIVISION OF ACCOUNTS - WATER

Plant and Equipment and Plant and Equipment Depreciation Schedule

PU	Title of Account	Balance at beginning of year 1944	Additions during 1944	Deductions during 1944	Balance December 31, 1944	Depreciation Accrued to Jan. 1, 1944	Accrued during 1944	Total Accrued to Dec.31,1944
104	WATER DIVERSION RIGHTS	1,500.00			1,500.00			
105	RESERVATION LAND							
	Watershed Extension Fund	2,499,363.76			2,499,363.76			
	New Storage Reservoir	124,527.97			124,527.97			
	Exchange for Water	116,280.00			116,280.00			
	Bureau of Water Revenue	62,405.80			62,405.80			
	Searches on Land	18,051.66			18,051.66			
109	STORAGE RESERVOIR LAND							
	Belleville Reservoir	1.00			1.00			
	Surrounding Belleville Reservoir	12,000.00			12,000.00			
	Ferris Property, Belleville	7,175.00			7,175.00			
	Surrounding So. Orange Ave. High Pressure Reservoir	1.00			1.00			
110	OTHER DISTRIBUTION SYSTEM LAND							
	Right of Way - Slingerland and Debow	1,200.00			1,200.00			
	Right of Way-Belleville #1	450.00			450.00			
	Right of Way-Belleville #2	728.35			728.35			
	Improvements along Pipe Line at Montclair	2,767.00			2,767.00			
	Strip, Central Ave. & Hecker St.	1.00			1.00			
112	RESERVATION STRUCTURES							
	Macopin Village	80,735.14			80,735.14	43,127.37	1,614.70	44,742.07
	Superintendent's House, Watershed	16,844.34			16,844.34	2,997.52	336.89	3,334.41
	Forester's House, Watershed	4,649.14			4,649.14	649.13	92.98	742.11
	Orean Park Road	21,447.18			21,447.18			
	Forestry	16,932.28			16,932.28			
	Concrete Beaches, Watershed	215.09			215.09	193.59	20.50	214.09
	Incinerator-Macopin Intake	738.09			738.09	369.03	73.81	442.84
	Garage - Watershed	993.15			993.15	352.66	19.86	372.52
104	WATER DIVERSION RIGHTS							
113	IMPOUNDING RESERVOIRS							
	Cost of Watershed, except Pipe Line	3,521,710.34			3,521,710.34	550,000.00	25,000.00	575,000.00
	Searches	2,738.00			2,738.00			
	Possibilities accruing from Watershed	5,780,431.33			5,780,431.33			
113	Macopin Intake-Guniting Dam	11,772.72			11,772.72			
	Echo Lake Dam	339,834.21			339,834.21			
	Raising Dam - Oak Ridge	671,733.89			671,733.89			
	Auxiliary Dam, Charlotteburg etc.	18,302.10			18,302.10			
	New Charlotteburg Dam	22,372.53			22,372.53			
	Raising Overflow, Clinton Reservoir	7,072.28			7,072.28			
	Canistear Channel	8,068.88			8,068.88			
	Wanaque Reservoir	14,349,903.28			14,349,903.28	1,350,000.00	135,000.00	1,485,000.00
	Preliminary Cost of Furnishing Added Water Supply	15,378.00			15,378.00			
115	SPRINGS & WELLS							
	Driven Wells, Belleville	22,275.21			22,275.21	22,274.21		22,274.21
	Caisson Wells, Belleville	2,453.80			2,453.80	2,452.80		2,452.80
	Drilled Wells, Belleville	36,165.18			36,165.18	36,164.18		36,164.18
118	INTAKE & SUPPLY MAINS							
	Cost of Watershed Pipe Line (M.R. Sherrerd's Estimate)	2,658,699.12			2,658,699.12	1,100,000.00	50,000.00	1,150,000.00
	Butler Connection	3,965.48			3,965.48	1,903.43	79.31	1,982.74
	48" Pipe Line - Gate House, Pequannock	132,755.71			132,755.71	132,754.71		132,754.71
119	SETTLING BASINS							
	Settling Basins, Belleville	1.00			1.00			
124	CHEMICAL TREATMENT PLANT							
	Chlorine Feeding Apparatus	12,401.90			12,401.90	11,316.90	271.00	11,587.90
	Chlorine Building, Macopin	10,093.65			10,093.65	1,918.13	201.87	2,120.00
	Copper Screens-Macopin		10,058.00		10,058.00			
	Chlorine Plant, Montclair	46,666.64			46,666.64	1,970.65	933.33	2,903.98

DIVISION OF ACCOUNTS - WATER

Plant and Equipment and Plant and Equipment Depreciation Schedule

PU	Title of Account	Balance at beginning of year 1944	Additions during 1944	Deductions during 1944	Balance December 31, 1944	Depreciation Accrued to Jan. 1, 1944	Accrued during 1944	Total Accrued to Dec. 31, 1944
127	PUMPING STATION STRUCTURES							
	Belleville Chimney	10,057.25			10,057.25	10,056.25		10,056.25
	Belleville Riverwall & Dock	266,111.99			266,111.99	266,110.99		266,110.99
135	STORAGE RESERVOIRS, TANKS & STAND PIPES							
	Belleville Keeper's House	5,421.35			5,421.35	4,636.89	108.43	4,745.32
	Belleville Receiving Resvr.	149,435.73			149,435.73	149,434.73		149,434.73
	Belleville Fence	2,550.09			2,550.09	2,549.09		2,549.09
	Belleville Res. Appurtenance	10,548.99			10,548.99	10,547.99		10,547.99
	So. Orange Av. H.P. Reservoir	98,829.62			98,829.62	98,828.62		98,828.62
	Keeper's House - 9th St.	9,220.25			9,220.25	3,096.51	184.41	3,280.92
	Cedar Grove Reservoir	1,186,684.94			1,186,684.94			
	Cedar Grove Fence	13,956.90			13,956.90	13,955.90		13,955.90
	Keeper's House, Laboratory and Road	2,924.32			2,924.32	2,923.32		2,923.32
	Cedar Grove Water System	692.79			692.79	692.79		692.79
	Cedar Grove Garage	1,240.07			1,240.07	465.22	24.80	490.02
136	DISTRIBUTION MAINS & ACCESSORIES							
	High Pressure System	1,155,488.13			1,155,488.13	270,379.13	11,554.88	281,934.01
	L.P. Distribution Mains General	10,849,999.24	8,859.18		10,858,858.42	4,855,627.81	216,999.98	5,072,627.79
	Pitometer Boxes	85,931.59			85,931.59	85,684.56	34.12	85,718.68
	60" Steel Pipe Line	585,000.00			585,000.00	568,545.29	16,453.71	584,999.00
	36" Cast Iron Pipe Line	215,000.00			215,000.00	84,250.00	4,300.00	88,550.00
	60" Steel Supply Main #1	465,427.78			465,427.78	139,142.97	9,308.56	148,451.53
	60" Steel Supply Main #2 (Elizabeth)	1,091,338.64			1,091,338.64	279,373.49	21,826.77	301,200.26
139	FIRE HYDRANTS & FIRE CISTERNS							
	High Pressure Hydrants	116,098.41			116,098.41	26,963.71	1,160.98	28,124.69
	Low Pressure Hydrants	452,551.97	394.68		452,946.65	182,327.44	9,051.04	191,378.48
141	GENERAL STRUCTURES							
	Land, West Side of Bloomfield Av. & No. 6th St.	2,300.00			2,300.00			
	Pequannock Gate House Bldg., 5th & 6th Sts.	28,459.42			28,459.42	14,249.61	569.19	14,818.80
	8th St. Stable	38,015.74			38,015.74	22,147.61	760.31	22,907.92
	Land between 8th & 9th Sts.	2,000.00			2,000.00			
	Land for Stable & Pipe Yard, So. 8th St. & 14th Ave.	11,000.00			11,000.00			
	Land - West Side Summer Ave.	4,000.00			4,000.00			
	New Meter Testing Station	48,662.93			48,662.93	25,361.89	973.26	26,335.15
	Land - Wilson Ave.	5,560.00		5,560.00				
	Land - Stockton St.	750.00		750.00				
	Stock Yard	37,198.77			37,198.77	37,198.77		37,198.77
	Franklin St.	14,500.00			14,500.00			
	Cedar Grove Laboratory	40,813.70			40,813.70	12,979.26	816.27	13,795.53
	Frame Bldg.-Little Falls &c	962.69			962.69	46.50	19.25	65.75
	Utility Bldg.-Charlotteburg		31,880.00		31,880.00		31,880.00	31,880.00
		47,672,535.50	51,191.86	6,310.00	47,717,417.36	10,426,020.65	539,670.21	10,965,690.86
	MISCELLANEOUS EQUIPMENT							
142A	General Office Equipment	54,936.73	29.80		54,906.93	45,279.09	1,587.53 29.80	46,836.82
142B	General Shop Equipment	62,051.62	2,307.29		59,744.33	56,494.89	1,863.23 2,223.29	56,134.83
142D	Transportation Equipment (Stable)	2,159.90			2,159.90	1,291.52	142.34	1,433.86
142D½	Transportation Equipment (Garage)	110,291.94	3,959.80		106,332.14	96,624.94	6,195.00 3,959.80	98,860.14
142E	Miscellaneous Equipment (Laboratory)	9,836.19	5.00		9,831.19	9,173.19	154.85 5.00	9,323.04
		239,276.38	6,301.89		232,974.49	208,863.63	9,942.95 6,217.89	212,588.69
143	OTHER TANGIBLE WATER CAPITAL							
	Engineers' Maps & Records	20,000.00			20,000.00			
		47,931,811.88	51,191.86	12,611.89	47,970,391.85	10,634,884.28	549,613.16 6,217.89	11,178,279.55

No.

DIVISION OF WATER

CAPITAL FUNDS

RECEIPTS AND DISBURSEMENTS - JANUARY 1ST TO DECEMBER 31ST, 1944

Balance - January 1, 1944			$ 351,032.62
RECEIPTS			
Sale of Stockton St.		$ 500.00	
Sale of Wilson Ave.		3,500.00	
Sinking Fund - For Payment of Term Bonds		475,000.00	
Fire Loss Settlement - Automobile		1,000.00	
do. - Building		2,600.00	
do. - Screens		128.15	
do. - Equipment		830.00	
do. - Forestry		524.50	
Capital Improvement Fund - per 1944 Budget		600,000.00	
Operating Surplus for Utility Building Appropriation		34,055.00	1,118,137.65
			1,469,170.27
DISBURSEMENTS			
A - Weekly Payrolls	(Water Mains)	1,653.17	
A - Semi-monthly Payrolls	do.	2,685.59	
B - Service by Contract or Agreement	do.	3,465.55	
C - Materials and Supplies	do.	874.03	
D - Miscellaneous	do.	-	
B - Utility Building - Charlotteburg		31,434.00	
A - Fire Loss Replacements - Forestry (S/M P/R)		524.50	
E - do. - Equipment		1,958.15	
Appropriation for Capital Improvements		992.00	
Capital Surplus to 1944 Dedicated Revenue		47,000.00	
Sinking Fund - Term Bonds Paid		475,000.00	
Purchase of U.S. Securities - Cap. Imp. Fund		600,000.00	1,165,586.99
Balance - December 31, 1944:			
Capital Surplus		4,826.51)	
Construction Funds		298,756.77 *)	
			303,583.28

* Unpaid Commitments 12-31-44 $11,110.00

No.

DIVISION OF WATER

ANALYSIS OF CAPITAL CASH AVAILABLE TO FINANCE UNCOMPLETED AUTHORIZED CONSTRUCTION WORK BY ORDINANCE - DECEMBER 31, 1944.

Total Capital Cash Balance - December 31, 1944	$ 303,583.28	
Less Other Than Construction by Ord. Cash:		
Capital Surplus		4,826.51
Ledger Balance of Cash Available for Construction Work by Ordinance - December 31, 1944		298,756.77
Less Unpaid Construction Commitments - December 31, 1944		11,110.00
Total Funds Available and Authorized for Construction Work by Ordinance - December 31, 1944		287,646.77

UNCOMPLETED AUTHORIZED CONSTRUCTION WORK BY ORDINANCES - DECEMBER 31, 1944.

WATER MAINS - CONSTRUCTION AND RECONSTRUCTION

$ 300,000.00	Ordinance of 3-10-43 shows an uncompleted authorized construction work amount of	282,871.77

UTILITY BUILDING - CHARLOTTEBURG

$ 36,655.00	Ordinance of 6-18-44 shows an uncompleted authorized construction work amount of	4,775.00
Net Total of amounts of uncompleted authorized construction work by ordinances, agreeing with above "Total Funds Available and Authorized for Construction work by Ordinances " as of December 31, 1944		287,646.77

DIVISION OF WATER

CAPITAL CONSTRUCTION - DECEMBER 1944

	GARAGE	LABOR	MATERIALS	MISC.	TOTAL
Pressure System	-	$ 794.63	$ 347.28	$ 606.00	$ 1,747.91
aying	-	-	-	-	-
Pressure Hydrants	-	266.08	128.60	-	394.68
lity Building	-	-	-	1,551.00	1,551.00
ens - Watershed	-	-	-	10,058.00	10,058.00
		$ 1,060.71	$ 475.88	$ 12,215.00	$ 13,751.59

CAPITAL CONSTRUCTION - JANUARY 1st to DECEMBER 31st, 1944

Pressure System	-	4,060.20	727.43	4,071.55	8,859.18
ying	-	-	-	-	-
Pressure Hydrants	-	266.08	128.60	-	394.68
ity Building	-	-	-	31,880.00	31,880.00
ens - Watershed	-	-	-	10,058.00	10,058.00
	-	$ 4,326.28	$ 856.03	$ 46,009.55	$ 51,191.86

DEPARTMENT OF PUBLIC WORKS

DIVISION OF ACCOUNTS - WATER

FUNDED DEBT SCHEDULE - DECEMBER 31, 1944

Class of Bond	Sinking Fund Rate %	Date of Issue	Date of Maturity	Amount of Issue	Amount Outstanding	INTEREST %	Payable	Accrued 1944	Paid 1944	Accrued Jan. 1, 1945.
Street Main Bonds	2½	Feb. 1, 1914	Feb. 1, 1944	200,000.00		4½	Feb. & Aug.	750.00	4,500.00	
Watershed Extension Bonds	2½	Feb. 1, 1914	Feb. 1, 1944	100,000.00		4½	Feb. & Aug.	375.00	2,250.00	
High Pressure Bonds	2½	Feb. 15, 1914	Feb. 15, 1944	100,000.00		4½	Feb. & Aug.	531.25	2,125.00	
Watershed Extension Bonds	2½	Dec. 15, 1914	Dec. 15, 1944	200,000.00		4½	June & Dec.	8,625.00	9,000.00	
Street Main Bonds	2½	July 1, 1915	July 1, 1945	100,000.00	100,000.00	4½	Jan. & July	4,500.00	2,250.00	2,250.00
High Pressure Bonds	2½	July 1, 1915	July 1, 1945	100,000.00	100,000.00	4½	Jan. & July	4,500.00	2,250.00	2,250.00
Watershed Extension Bonds	2	June 1, 1916	June 1, 1946	100,000.00	100,000.00	4½	June & Dec.	4,250.00	4,250.00	354.17
Cedar Grove Reservoir Bonds	1	Apr. 1, 1905	Apr. 1, 1955	1,950,000.00	1,950,000.00	3½	Apr & Oct.	68,250.00	68,250.00	17,062.50
Newark Water Bonds	1	May 1, 1905	May 1, 1955	490,000.00	490,000.00	3½	May & Nov.	17,150.00	17,150.00	2,858.33
Oak Ridge Bonds	Serial	July 1, 1918	July 1, 1958	239,000.00	87,000.00	5	Jan. & July	4,525.00	2,350.00	2,175.00
Watershed Extension Bonds	Serial	Feb. 1, 1919	Feb. 1, 1959	300,000.00	120,000.00	4½	Feb. & Aug.	5,430.00	5,580.00	2,250.00
Wanaque Water Supply Bonds	Serial	Feb. 1, 1919	Feb. 1, 1959	500,000.00	210,000.00	4½	Feb. & Aug.	9,502.50	9,765.00	3,937.50
Water Bonds	Serial	Nov. 1, 1919	Nov. 1, 1949	300,000.00	50,000.00	4½	May & Nov.	2,625.00	2,700.00	375.00
Water Bonds	Serial	Oct. 15, 1920	Oct. 15, 1960	474,000.00	214,000.00	5½	Apr. & Oct.	12,423.13	12,595.00	2,452.08
Water Bonds	Serial	Mar. 1, 1921	Mar. 1, 1961	1,916,000.00	936,000.00	5½	Mar. & Sept.	52,030.00	53,130.00	17,160.00
Water Bonds	Serial	Sept.15, 1921	Sept. 15, 1961	978,000.00	488,000.00	5½	Mar. & Sept.	28,008.75	28,490.00	7,828.33
Water Bonds	Serial	Apr. 15, 1922	Apr. 15, 1962	481,000.00	215,000.00	4½	Apr. & Oct.	9,845.63	9,967.50	2,015.63
Water Bonds	Serial	Oct. 1, 1923	Oct. 1, 1963	500,000.00	285,000.00	4½	Apr. & Oct.	13,331.25	13,500.00	3,206.25
Water Bonds	Serial	Mar. 1, 1924	Mar. 1, 1964	975,000.00	575,000.00	4½	Mar. & Sept.	26,025.00	26,325.00	8,625.00
Water Bonds	Serial	July 1, 1924	July 1, 1964	958,000.00	558,000.00	4½	Jan. & July	25,560.00	13,005.00	12,555.00
Water Bonds	Serial	Dec. 15, 1925	Dec. 15, 1965	1,750,000.00	924,000.00	4½	June & Dec.	41,062.08	41,140.00	1,636.25
Water Bonds	Serial	May 1, 1926	May 1, 1966	500,000.00	220,000.00	4½	May & Nov.	9,491.66	9,562.50	1,558.33
Water Bonds	Serial	Nov. 15, 1926	Nov. 15, 1966	1,985,000.00	1,265,000.00	4½	May & Nov.	55,250.00	55,462.50	6,720.31
Water Bonds	Serial	Mar. 1, 1927	Mar. 1, 1967	489,000.00	319,000.00	4½	Mar. & Sept.	13,628.34	13,770.00	4,519.17
Water Bonds	Serial	Dec. 15, 1927	Dec. 15, 1967	1,575,000.00	960,000.00	4½	June & Dec.	42,632.82	42,712.50	1,700.00
Water Bonds	Serial	Mar. 1, 1929	Mar. 1, 1969	500,000.00	250,000.00	4½	Mar. & Sept.	10,695.84	10,837.50	3,541.67
Water Bonds	Serial	Mar. 15, 1929	Mar. 15, 1969	2,997,000.00	2,047,000.00	4½	Mar. & Sept.	92,771.25	93,690.00	26,866.88
Water Bonds	Serial	Mar. 1, 1930	Mar. 1, 1970	2,169,000.00	1,469,000.00	4½	Mar. & Sept.	66,480.00	67,230.00	22,035.00
Water Bonds	Serial	June 1, 1931	June 1, 1971	959,000.00	699,000.00	4	June & Dec.	28,293.33	28,360.00	2,330.00
Water Bonds	Serial	Aug. 1, 1934	Aug. 1, 1972	1,000,000.00	800,000.00	5½	Feb. & Aug.	42,612.50	43,050.00	17,500.00
Water Bonds	Serial	June 1, 1936	June 1, 1976	499,000.00	419,000.00	3½	June & Dec.	13,752.91	13,780.00	1,134.79
Water Bonds	Serial	Jan. 15, 1937	Jan. 15, 1976	279,000.00	204,000.00	2½	Jan. & July	5,615.72	5,678.75	2,571.25
Water Bonds A	Serial	May 1, 1939	May 1, 1959	200,000.00	150,000.00	3½	May & Nov.	4,983.34	5,037.50	812.50
Water Bonds B	Serial	May 1, 1939	May 1, 1959	85,000.00	65,000.00	3½	May & Nov.	2,155.83	2,177.50	352.08
Water Bonds C	Serial	May 1, 1939	May 1, 1959	200,000.00	150,000.00	3½	May & Nov.	4,983.34	5,037.50	812.50
Water Bonds A	Serial	May 15, 1940	May 15, 1960	200,000.00	160,000.00	3	May & Nov.	4,912.50	4,950.00	600.00
Water Bonds B	Serial	May 15, 1940	May 15, 1960	150,000.00	126,000.00	3	May & Nov.	3,847.50	3,870.00	472.50
Water	Serial	July 1, 1940	July 1, 1962	156,000.00	132,000.00	2½	July & Jan.	3,037.50	1,552.50	1,485.00
Totals	$2,682,400.45 Sinking Fund			$26,614,000.00	$16,837,000.00 As per Balance Sheet		As per Revenue Statement	$744,443.97	$737,331.25	$184,003.02 As per Balance Sheet

DIVISION OF WATER

CASH EXPENDITURES - JANUARY 1ST, 1944 TO DECEMBER 31ST, 1944.

CHARGES TO BUDGET CONTROL ACCOUNTS

UDGET CONTROL ACCOUNT	Cash Expended & Committed 12 mos.	1944 Appropriation 12 mos.	Unexpended Balances 12-31-44
SERVICE			
Payment of Bonds	$ 592,000.00	$ 592,000.00	$ none
Sinking Fund	18,030.20	18,030.20	none
Interest on Bonds	744,443.97	744,443.98	.01
Total Debt Service	1,354,474.17	1,354,474.18	.01
TAL IMPROVEMENT FUND	600,000.00	600,000.00	none
DEFENCE - GUARD EXPENSE			
Salaries & Wages	25,761.38	30,000.00	4,238.62
Other Expenses	720.13	9,600.00	8,879.87
Total Local Defense - Guard Expense	26,481.51	39,600.00	13,118.49
ENANCE & OPERATION			
Salaries & Wages	846,328.33	851,316.00	4,987.67
Other Expenses	202,865.90	229,522.00	26,656.10
Total Maintenance & Operation	1,049,194.23	1,080,838.00	31,643.77
CUK - MAINTENANCE & OPERATION	182,104.31	182,104.31	none
TOTALS	3,212,254.22	3,257,016.49	44,762.27

RECEIPTS AND DISBURSEMENTS - JANUARY 1ST TO DECEMBER 31ST, 1944.

BALANCE - January 1, 1944			$ 672,875.35
OTHER THAN 1944 DEDICATED REVENUE RECEIPTS			
N.G. Check Account		$ 2,543.44	
Overpayment Account		1,274.53	
From City Current Account		54.45	3,872.42
			676,747.77
LESS OTHER THAN BUDGET DISBURSEMENTS			
Due to City Current Account		300.00	
N.G. Check Account		2,543.44	
Overpayment Account		1,388.36	
A (1943) Weekly Payroll	$ 21,221.64		
Less Capital	12.48	21,209.16	
B (1943) Service by Contract		10,026.88	
C (1943) Materials and Supplies		13,254.05	
D (1943) Miscellaneous $1.27 - Taxes $20,539.97		20,541.24	
E (1943) Equipment		13,439.15	
1943 - Interest on Bonds		176,890.30	
1943 - Appropriation Reserve		1,923.82	
Operating Surplus to Dedicated Revenue		200,000.00	
Operating Surplus to Appr. for Utility Building		34,055.00	495,571.40
			181,176.37
DEDICATED REVENUE RECEIPTS			
OPERATING REVENUE			
Metered Service	2,855,505.71		
N.G. Check Account	84.45	2,855,590.16	
Unmetered Service		36,492.07	
Municipal Service		26,928.79	
Builders		266.55	
Special		585.95	
No.Jersey Dist.Water Supply Comm.		244,305.96	
MISCELLANEOUS OPERATING REVENUE			
New Services - one inch (1")		7,168.41	
Comptroller Collections		10,255.35	
Sundry Personal		50,053.04	
City Capital Account		78.20	
NON-OPERATING REVENUE			
Rent		3,178.00	
From Operating Surplus		200,000.00	
From Capital Surplus		47,000.00	3,481,902.48 *
			3,663,078.85
BUDGET CONTROL DISBURSEMENTS			
A - SALARIES & WAGES			
Weekly Payrolls	401,870.80		
Less Capital	1,640.69	400,230.11	
Semi-monthly Payrolls	455,157.41		
Less Capital	3,210.09	451,947.32	
OTHER EXPENSES			
B Service by Contract or Agreement		221,856.33	
C Materials and Supplies	46,055.64		
Less Capital	856.03	45,199.61	
I Interest on Bonds		560,440.95	
Serial Bond Payments		592,000.00	
Sinking Fund Requirements		18,030.20	
Taxes	$ 75,024.96		
Less Refund	155.57	74,869.39	
Miscellaneous	15,066.18		
Less Refund	10.00	15,056.18	1,260,396.72
E Equipment			1,500.81
Transfer to Capital Improvement Fund			600,000.00 2,981,130.90 **
Balance - December 31, 1944			681,947.95
Dec. 31, 1944 - Unpaid 1944 Budget Charges & Commitments			231,123.32 **
* 1944 Dedicated Revenue Receipts		3,481,902.48	
** 1944 Budget Expenditures & Commitments		3,212,254.22	

DIVISION OF WATER

ANALYSIS OF OPERATING CASH BALANCE - DECEMBER 31, 1944.

Amount of Cash Pledged for:

1944 Budget Control Charges & Commitments

1944 Operating Commitments - December 31, 1944	$ 27,130.22	
1944 Local Defense Commitments - December 31, 1944	77.80	
Interest Accrued on Bonds " 31, 1944	184,003.02	
Accrued Weekly Payroll to " 31, 1944	19,868.89	
Accrued Semi-monthly Payroll to " 31, 1944	43.39	
Total 1944 Budget Control Charges & Commitments		$ 231,123.32

Other Pledged Cash

1943 Operating Commitments	1,721.19	
Due to City Current Account	19.64	
1944 Appropriation Reserve	44,762.27	
Overpayment Account	420.91	46,924.01
Total Pledged Cash		278,047.33
Operating Fund Surplus Cash		403,900.62
Operating Cash Balance - December 31, 1944		681,947.95

DIVISION OF WATER - STATEMENT OF EARNINGS & EXPENDITURES - JANUARY 1, 1944 TO DECEMBER 31, 1944

Net Sales of Water - No. Jersey - Wanaque				$ 233,873.54	
Net Sales of Water				2,912,798.54	
Miscellaneous Operating Revenue				4,519.91	
Services				15,958.53	
Sundry Personal				11,468.03	
Repairs - Meters				24,777.16	
Rents - Non-Operating Revenue				3,198.00	
Scrap Iron Non-Operating Revenue				712.46	
Total Operating Revenue				3,207,306.17	
Deduct:					
Water Collecting Expenses -			Watershed		
411A	Coll. System Superintendence		$ 10,916.14		
411B	Coll.System Labor:				
#1	Reservoir Keeper & Helper	$ 3,278.28			
#2	Policing Watershed	10,601.42			
#4	Caretaking Reservoir & Grounds	21,951.07			
#6	Cutting Lumber	3,898.88			
#8	Forestry	2,375.42			
#9	Cleaning Toilets,Garbage Disposal &c	8,674.89	50,779.96		
412	Other Coll. System Expenses		12,398.85		
413	Water Purchases - Wanaque	182,104.31			
	State (Diversion)	15,331.80	197,436.11		
415A	Repairs of Reservations:				
#1	Buildings	7,047.53			
#2	Resurfacing Road	-			
#5	Repairs to Motors or Parts Thereof	4,391.78	11,439.31		
415G	Repairs to Intake & Supply Mains		486.95		$ 283,457.32
Defense Work -					
411B	(10) Guarding Watershed	19,330.83			
412	(A1) Material	542.48			
461	(C7) Defense Work	6,430.55			
461	(D1) Material	177.65			
486	Insurance	-			26,481.51
Purification System Expenses -			City		
421A	Purification Superintendence		7,827.78		
421B	Purification Labor		25,684.26		
422	Purification Supplies & Expenses		14,762.03		
425	Repairs of Chemical Treatment Plant		14.00		48,288.07
Distribution System Expenses -					
461A	Distribution Superintendence		31,234.35		
461B	Storage Reservoir Labor		28,276.45		
461C	Other Distribution Labor:				
#1	Operating Transmission Lines	11,586.68			
#2	Operating Distribution System	52,936.79			
#3	Operating and Inspecting Services	26,587.81			
#4	Inspecting Hydrants	3,414.64			
#5	Flushing Mains	13.97			
#6	Reserve and Stand-by Duty	56,135.82			
#8	Removing Trees	786.26	151,461.97		
461D	Other Distribution Expenses		7,155.77		
462A	Consumers' Meter Expenses		25,051.11		
462B	Consumers' Installation Expenses		15,865.07		
466	Repairs of Storage Reservoir		17,733.29		
467A	Repairs of Transmission Mains		24,717.72		
467B	Repairs of Distribution Mains		26,381.77		
467C	Repairs of Consumers' Services		20,865.58		
467D	Repairs of Fire Hydrants & Cisterns		17,538.18		
468	Repairs of Consumers' Meters		41,223.09		
	Services		15,473.33		
	Sundry Personal		15,554.10		438,531.78
Commercial and New Business Expenses -					
470A	Commercial Office Salaries		52,244.31		
470B	Meter Reading and Collecting		93,600.03		
470C	Other Commercial Expenses		11,763.82		157,608.16
General and Miscellaneous Expenses -					
481	Salaries of General Officers		11,028.23		
482	Other General Office Salaries	86,973.97			
482A	General Studies and Reports	1,729.68	88,703.65		
483	General Office Supplies & Expenses		10,444.41		
484	Legal Expenses		1,080.00		
485	Injuries and Damages - Accidents	8,146.54			
485A	Injuries and Damages - Ill Health	44,699.19	52,845.73		
486	Insurance		3,592.23		
487	Relief Dept. and Pensions	9,451.31			
487A	Relief Dept. and Pensions-Military	804.75	10,256.06		
490A	Store Expenses	20,052.57			
#1	Store Expenses	1,820.63	18,231.94		
490B	Transportation Expenses		5,665.94		
491	Misc.Gen'l. Expenses-Audits & Surveys		3,000.00		
493	Repair of General Structures		18,213.32		
494	General Amortization		610,030.20		
495	Taxes		79,271.40	912,363.11	1,866,729.95
					1,340,576.22
511	Interest - Funded Debt				744,443.97
	Revenue Surplus - January 1st to December 31st, 1944				596,132.25

DIVISION OF WATER

COMPARATIVE INCOME ACCOUNT

Public Utility Form

December 31, 1944

Item (or Account)		Amount Applicable to the year	Comparison preceding year
		Totals	
r Operating Revenue		3,203,395.71	5,967.42
ating Revenue Deductions		1,866,729.95	18,501.64
r Operating Income		1,336,665.76	12,534.22
r Operating Income			
scellaneous Rent Revenues	3,198.00		
her Non-Operating Revenues	712.46		
Total Miscellaneous Income		3,910.46	12,614.18
ross Corporate Income		1,340,576.22	79.96
ctions from Gross Income			
terest on Long Term Debt		744,443.97	46,568.18
Net Corporate Income		596,132.25	46,488.22

DIVISION OF WATER

Schedule of Water Consumption and Revenue

PUBLIC UTILITY FORM

Year Ended December 31, 1944

Account	No. of consumers Dec. 31, 1944.	Maximum No. during year	No. of M.G. delivered to consumers during year	Net Amount Credited to Revenue	Average Net Revenue per M.G.	Percentage of Revenue
Metered Private Service	52,828	52,841	18,059.011	$ 2,447,972.19	$135.55	77.80%
Unmetered Private Service	850	1,060)				
Unmetered Private Service (not in use)	78	107)	248.429 Est.	36,531.52	147.05	1.16
Service to Other Systems (Water Supply)	20	20	5,498.088	400,488.09	72.84	12.73
Manaque Water sold direct to other Systems			(not known)	233,873.54		7.43
Municipal Water Service to Other City Departments	270	270	415.170	26,996.85	65.03)	
Miscellaneous Water Service			5.507 Est.	809.89	147.05)	.88
	54,046	54,298	24,226.205	$ 3,146,672.08		100%

Miscellaneous Operating Revenue

Services Tapping Mains	15,958.53
Work for Other Bureaus - Repairing Meters	24,777.16
Sundry Personal	11,468.03
Wood, etc.	3,814.91
Fees, etc.	705.00
Total Operating Revenue	$ 3,203,395.71

DIVISION OF WATER

WATER PURCHASED OR SOLD

Public Utility Form

	No. of M.G. delivered to consumers during year	Average Price per Million	Amount Credited to Revenue	Amount Charged to Expense
Town of Belleville	894.835	$ 85.00	$ 76,060.97	
Town of Bloomfield	1,464.000	30.00	43,920.00	
Town of Bloomfield	308.906	100.00	30,890.55	
City of Elizabeth	2,546.270	85.00	216,432.95	
Elizabethtown Water Co.	17.222	108.41	1,867.02	
Commonwealth Water Co. (Town of Irvington)	112.090	101.27 (Minimum)	11,351.32	
Town of Montclair		(Minimum)	2,500.00	
City of East Orange	3.449	90.00	2,500.00	
Pequannock Township			310.45	
Wayne, N. J. - Packanack Lake Development Co.	76.769	103.50	7,945.60	
Wayne Township - Dept. of Water	26.390	90.00	2,375.13	
Cedar Grove (Overbrook) - Essex Co. Board of Freeholders	48.157	90.00	4,334.10	
No.Jersey Dist.Water Supply Comm.	8,498.500	21.43		182,104.31
James B. Sauter, State Treas.	6,132.721	2.50		15,331.80
	20,129.309		$ 400,488.09	$ 197,436.11

TERRITORY SERVED DURING YEAR

Newark

Permanent Population (Estimated)	440,000 Est.
Total Number of Consumers - December 31, 1944	54,046
Taps Metered	53,118
Taps Unmetered	928
Total Capacity of Storage Reservoirs (M.G.)	11,405
Total Number of Storage Reservoirs	4
Total Number of Distribution Reservoirs	3
Total Capacity of Distribution Reservoirs (M.G.)	701.7
Total Number of Miles of Mains	582.71
Total Number of Fire Hydrants	4,876

MONTHLY OUTPUT (Million Gallons)

	PEQUANNOCK	WANAQUE
January	1,460.9	765.5
February	1,346.1	718.2
March	1,501.4	665.8
April	1,470.9	591.1
May	1,649.9	668.7
June	1,599.0	694.9
July	1,757.3	770.2
August	1,790.9	809.0
September	1,650.2	733.7
October	1,668.4	719.2
November	1,587.3	672.9
December	1,570.6	689.3
	19,052.9	8,498.5

Total Million Gallons of metered consumption during year	23,972.269
Estimated flat rate consumption, &c. including hydrants	253.936
Total million gallons used by respondent during year	24,226.205
Million gallons lost or unaccounted for (12.07%)	3,325.195
	27,551.400